The Builder.

VOL. XXXII.—No. 1661.

Iron and the Smith.

GENERALLY the discovery of iron is understood to have been long posterior to that of bronze. While it is as yet impossible to affix exact chronological dates to the first introduction of any of the elder metals into the service of man, it is ascertained, beyond reasonable doubt, that the employment of gold was earlier than that of bronze, and that the manufacture of bronze preceded that of iron. Silver is interposed (perhaps in the first instance by the poets) between gold and bronze; but of the justice of that attribution it is difficult to form an opinion. It is, however, easy to understand that metal which is found in a virgin state, as in the case of gold, would more readily yield its resources to human industry, than metal found only in a state of ore. But even here we must speak with some reserve, as we are aware of the actual existence, although rare, of tolerably pure virgin iron, in the form of meteoric deposit, while we are unable to cite an instance of virgin bronze.

But while we cannot reduce the date of the earliest work of the smith to historic time, there is no reason to doubt the sequence of the various metals, in so far as they were known to or used by man. It is rather the philosophical, than the historical, or chronological, date which we thus attain; but that is ample for our present need. At a distance of time which is uncertain, but which is to be measured by millenniums, rather than by centuries, and which may differ widely in different regions of the earth, the earliest inhabitants of our planet who have left any indications of their affinity to ourselves carved rude implements of stone, horn, and bone. Almost as early as any marks of industry of this nature, are the relics of a contemporary art. Man began to ornament, so far as we can tell, as soon as he began to work. With the lapse of time, the rude flakes of flint, or the hammers made of some hard stone, assumed greater elegance of form and delicacy of finish. During the period which has been termed the neo-lithic age of civilisation, bronze first made its appearance. Late in the bronze period, and, comparatively speaking, late in the historic period, we are accustomed to place the discovery of iron, to locate it in Crete, and to attribute it to the Idæan Dactyli.

Pliny, in his Natural History (xxxiv., 21), says, "Of all metals the veins of iron are most abundant." The metal is mentioned, under its Greek name *sideron*, by Thucydides, Euripides, and Æschylus, as well as by Xenophon. The earliest note of the word occurs in the Book of Genesis (iv. 22), where Tubal Cain is mentioned as the instructor of every artificer in brass (or rather bronze) and iron. The word here used, which is also translated iron where it occurs in the Book of Ezekiel, is *barzal*, which is derived from an Aramaic root meaning to pierce. Another word, *paldah*, cognate forms of which also occur in Arabic and in Syriac, is used by the prophet Nahum (ii. 4), and is explained by Gesenius to mean steel. It comes from a root meaning to cut. The Hebrew *barzal* appears as *parzal* in the Book of Daniel. It is difficult to identify either of these words with the Greek form, although that is originally allied to both the Latin *ferrum* and the English *iron*. We are, however, relieved from any doubt as to whether iron was known in the time of Moses, 3,400 years ago, by the discovery of a wedge or plate of iron embedded in the masonry of the Great Pyramid itself.

This instructive relic, like the half-fused magnifying lens found at Pompeii, throws much light on questions of early workmanship. It has been a great puzzle to those who attributed the first use of iron to a date not much more than 2,900 years back, how such sharp and well-defined hieroglyphics could have been cut, by the ancient Egyptians, on porphyry, granite, and the hardest stone. It may, indeed, be the case that, when bronze was the ordinary material for tools, the coppersmith had some secret as to the production of a very hard temper, now lost. But this is, at best, only a guess. From the certain proof that iron had been produced and wrought in the age of King Cheops, 5,400 years ago, we can better understand how the innumerable and exquisitely-sunk symbols and figures were wrought on tombs, temples, and sarcophagi. And more than that, from the great similarity in the mode of treatment, that prevailed from the time of the Ptolemies back to the very earliest known Egyptian inscriptions, we have something closely approaching a proof of the use of iron as far back as the fifth Egyptian dynasty, if not in the time of Menes himself; that is to say, six thousand three hundred years ago.

From that earliest use,—date it when we may,—the art of the founder and of the smith has advanced, with enormous strides, to our own times. If we distinguish the manufacture from the fabrication of iron,—that is to say, if we draw a line between metallurgy and smith's work,—there may be some reason for the opinion that, while the former is still in a state of rapid progress, the latter has passed its zenith. We are not about absolutely to insist on this point. Of the truth of the former position there can be no doubt. We must explain what leads us to entertain a suspicion as to the latter.

The great mechanical characteristic of the present age is the substitution of steam-power for manual labour. The signal for this enormous change,—a change which, it is not too much to say, is tending entirely to revolutionise the relations of mankind to the world on which they dwell,—was given by the genius of Watt. Our own eyes have witnessed, our own hands have laboured at, step after step in the mighty transformation. We can remember when, on one occasion, on the completion of a locomotive engine by Mr. Stephenson, steam was got up, and the machine, though well up to its duty on the rails, was unable to propel itself over the floor of the factory. The inference thence drawn, and not unnaturally, by the first engineers of the day was, that it was pure loss of time to turn attention to the propulsion of steam-engines on the common roads. This was hardly a third of a century ago, and what do we now see? At almost every county bridge, in some districts, at least, of England, a notice is affixed that the arch will not bear the weight of a traction-engine! Who has not seen these uncouth giants tracking their heavy and resistless course over the country, training behind them wagons, and quaintly-shaped machines for scarifying and torturing the face of the earth, with apparent indifference to their number or their weight. Two very simple improvements have overcome the impossibility imagined by Mr. Stephenson. One of these is the old mechanical method of reduction of speed by cog-work. The piston travels at the speed which best suits the evaporative power of the boiler. The driving-wheel revolves at the slow pace fitted for progress over the road. This slow, irresistible, progress is rendered possible by the great breadth of the wheels, and by the oblique grooving recently introduced on their circumference.

What has been done in the locomotive, from the express engines of Mr. Brunel, able to take a train over the low gradients of the Great Western Railway at the rate of seventy miles an hour, to the slow but mighty traction engines, and the self-moving agricultural engines of to-day, is going on in every department of the work of the smith and the fitter. Machines, not indeed endowed with intelligence, but unerring in their discharge of duty, and themselves the offspring of the noblest mechanical intelligence, now deal with iron almost as a swallow deals with mud. They forge, roll, hammer, plane, punch, and drill. They turn out hammered or pressed iron, untouched by the hammer of the smith, in every form; from the gun that weighs thirty-five tons, to the hair spring of a watch. Hardly any tool can be named which is not produced, or likely to be produced, more readily, accurately, and cheaply, by machinery than by hand. But this great facility does not tend to improve the handiwork of the smith.

If we contrast this state of things with that which prevailed three hundred years ago, we shall see that against all our gain,—and we are among the last to undervalue it,—we have to set off a certain loss. The highest skill displayed in the work of the smith was found in the craft of the armourer. To that craft a fatal blow was given by the tilting-lance of De Montgomeri, when, in curious coincidence with the prophecy of Nostradamus, it entered the helmet of Henry II. of France. Three influences thus combined; and led, within a couple of generations, to the disuse of armour, and thus to the extinction of the most skilful, workmanlike, and artistic employment of the smith. These were, the death of the King of France, which was too serious a matter to result, without producing a powerful effect from the amusement of the tourney; the increasing excellence of gunpowder and guns; and the reign of a female Sovereign in England. When we look at the armour of the time; when we note that the tilting armour, which by the introduction of the pauldron, and other devices, had lost its symmetry, attained the weight of a hundred pounds *avoirdupois*; when we observe the exquisite delicacy with which the Milanese armourers wrought the mail that was like steel gossamer, or the scale or folding plate that fitted the limbs like the carapace of a lobster,—we may well be of opinion that few smiths of the nineteenth century can hold a candle to their ancestors of the sixteenth.

Connected with the extreme care that was given to the fabrication of defensive armour, was that bestowed upon offensive weapons. The fame of two descriptions of sword-blades has been established since the Middle Ages, and even since the crusades. One of these is the Toledo rapier, a long, straight sword, the undoubted excellence of which must, we believe, be chiefly attributed to the original quality of the ore employed by the makers. The other was the Damascus sabre, or scimitar, a curved blade, of such exquisite temper that, when handled by a master of that description of fence, it could cut in two with equal ease a floating scarf of gauze or silk, or the neck of a horse, or of his

rider. The excellence of the Damascus blades we are disposed to attribute rather to the skill and patience of the smith, or at least of the maker of the iron, than to the original quality of the metal. For it is to the repeated working up of scraps, and rusty scraps, of iron, that the beautiful mottling of the Damascus blades is due. It seems to us not improbable that these numerous welds, none of which are so perfect as to have been obliterated under the hammer, act like the teeth of a very fine saw, and thus cut with a keenness unattainable by a more homogeneous and smoother edge. It should, however, be borne in mind, that the difference between the iron produced from different ores is, in our present stage of metallurgic practice, extreme. There is an iron made in our North Midland counties which is so hard that it is almost impossible to break up old castings made of it. On the other hand, when the French *usines* began to make rails, some twenty-one years ago, an English fitter, with a cold-chisel and a hammer, could cut one of them in two in less than a quarter of an hour.

The earliest use of iron, as an offensive weapon, was probably in the form of arrow-heads. Bright points of this nature, which are said to be a thousand years old, are preserved with great reverence in the museums of that wonderful country, Japan. It is far from improbable that meteoric iron was, in the first instance, thus employed. At all events, the purity of the metal, and the care and patience with which it was wrought, were extreme. Among the antiquities of India is to be found an iron column, so large and so perfect, that we could not produce the like at the present time, without the aid of steam machinery.

After the demand for the highest class of smith's work,—that is to say, armour, and offensive weapons intended to pierce armour,—had ceased, the decorative taste of Italy, of Germany, and even of our own country, was gratified by the production of much admirable ornamental iron work. Park and garden gates tasked the skill, and displayed the taste, of the smith. The uniformity of a line of iron palisades was agreeably broken by flourishes and scrolls; each of which was stamped by a certain individuality. In the South Kensington Museum are to be found fine specimens of English and Roman work of this nature. Much ironwork is now in rapid decay throughout the country, which it would be a good deed to rescue from destruction. We saw a beautiful specimen of this kind, not so very long ago, on a *perron* in the High-street of Rochester. In other places the intelligent care of the proprietors, and the renewal of painting and of gilding, have kept the ironwork of the seventeenth century as fresh as that of to-day. Such are the goodly scrolls and flourishes that adorn the Town Hall of Guildford, and decorate its great projecting clock, erected in 1681.

To the demand for this bold, permanent, and manly kind of ornamentation a fatal blow was given by the increasing skill of the moulder and of the caster. The heavy railings recently removed from the west end of St. Paul's Churchyard were among the first, if not the very first, in which cast was substituted for wrought iron. It is said that the enterprising contractor made much money by his ingenuity in this respect. Economy soon prescribed laws of retrenchment as to ornamental ironwork; and here again, as in the case of the invention of gunpowder, the increased use of iron was made at the expense of the occupation of the smith.

The points to which attention are now chiefly directed, with regard to iron, apart from the mischievous result of ill-regulated competition in producing, for the smallest price, the largest possible quantity of inferior metal, are its reduction from the ore without the intervention of manual labour; the chemical purification of the metal, and the removal of those minute proportions of sulphur and of phosphorus which destroy its tenacity; and the production of steel, or carbonised iron, by simple procedures. There is, perhaps, no instance in which mechanical invention is removing a greater curse from labour than in the case of puddling iron. Those who have watched the process, or who have studied the beautiful representations of furnace-work given by the graceful pencil of Moritz Retsch, in his illustrations to Schiller's "Song of the Bell," are aware of the exhausting nature of the labour undergone by the puddler. It is, we think, the hardest labour now performed by man. As involving a certain amount of experienced judgment, it is of a higher grade than that of the brick-moulder; but the suffering it involves from heat is far keener than that inflicted, in the latter case, by cold and damp. For dirt they are about on a par. It is always the case that those occupations which, from their danger or their hardship, command extra wages, have a demoralising effect on the workman. At the same time, just in proportion to the danger, especially if there be any risk of life, is it found that any attempt at introducing an easier process is steadily and fiercely opposed by those who think that they have acquired a vested interest in their craft. The manufacturers of iron are, to a great extent, at the mercy of the puddlers; and the chief gainers by the high wages which this arduous work rightfully earns are, no doubt, the brewers. It is, therefore, in the interests of morality, of public health, and of the elevation of the workman in the social scale, no less than in that of the manufacturer and of the purchaser of iron, a source of great satisfaction to find that the experiments recently made on the mechanical puddling of iron have been so satisfactory, that it seems now to be only a question of time as to the entire disuse of the hand-puddling process.

Anything which tends to make manufactured iron at once cheaper and better is a boon to the smith. It is the bad quality of common iron, rather than any inherent defect in the metal, which renders the architect often averse to the employment of smith's work, when nothing else is so truly appropriate. We must conclude that what renders one sample of iron less tenacious than another is some chemical impurity in the metal, which it is within the power of perfectly instructed metallurgical skill to remove. These admixtures are often extremely small, if measured by any test but that of the depreciation of the quality of the iron. Measured by that test, their presence assumes extreme importance. Mr. Kircaldy, by his numerous experiments, has added no small amount of positive knowledge to that which we possessed before, on the actual resistance of various makes of iron, both to tension and to compression. In his "Experiments on Wrought Iron and Steel," we find the breaking-weights of iron bars to range from 160,520 pounds per square inch of fractured area in the Swedish R. F. charcoal iron, to 63,883 pounds per square inch of fractured area in Russian C. C. H. D. iron, a difference not far short of three to one. In iron plates, looking at domestic production only, the breaking-weight per square inch of fractured area ranges from 92,468 pounds in Yorkshire plate, to 43,460 in common Scotch ship-plate. This is more than two to one in favour of the Yorkshire iron. It is also a very suggestive comparison with reference to naval security.

An uncomfortable suspicion pervades the public mind,—and even professional men are not altogether free from its influence,—that, under some unexplained circumstances, the texture, or molecular arrangement of iron, used in buildings or in machinery, undergoes a mysterious change. Fractures of axles or of tyres in railway collisions are the *phenomena* which have been chiefly cited as requiring this very alarming explanation. Many writers have ridiculed the idea; but ridicule is an unsatisfactory substitute for scientific analysis. It has, however, been pointed out, that "the two different appearances, respectively known by the terms 'a fibrous fracture,' and 'a crystalline fracture,' are produced by the iron breaking gradually in the one case, and suddenly in the other. Hence, when the appearance presented was fibrous, it only proved that the piece had been torn asunder; when it was crystalline, that it had snapped." This view, which is not matter of theory, but the outcome of experiment, fully explains all the *phenomena* of fracture which have led to the idea of some unexplained structural change. It is of the first importance, to the architect as well as to the engineer, that the facts should be known. An unexplained, mysterious danger, such as would be that of such a molecular change, if it could possibly occur without ascertainable cause, is more to be dreaded than any of those casualties which it is within the power of competent science, backed by competent care, almost absolutely to preclude.

By immersing specimens of iron in dilute hydrochloric or muriatic acid, the foreign impurities are removed, and the texture of the metallic portion is exposed to examination. Long immersion in water,—or, at least, in *some* water,—has the same effect; as we have witnessed in the bolts of a sunken vessel that had been for some fifty years exposed to the alternate action of fresh and salt water, in the river Seine. Thus treated, puddled iron rolled, or wrought iron in its lowest state, as in Scotch and Welsh puddled bars, presents a woolly appearance. In iron of a superior quality, the appearance presented is that of very fine threads or hairs, lying closely together. This is remarkable in Farnley and Bowling iron, as also in Russian bar. Swedish tilted bars present, even to the naked eye, a beautiful silvery variegated appearance. Of the beautiful Styrian iron, which is so highly prized in Italy, and which was probably employed by the famous armourers of Milan, we regret that we have found no analysis, or definite scientific description. It is most evident,—to use a mode of expression that has recently come into favour,—that there is iron and iron, no less than that there are smiths, and that there have been smiths.

PLAN AND MAP DRAWING.

Is plan-drawing an "art"? Or is it rather to be called a science, a business, or a "craft"? The question suggests itself, incidentally, in looking through the new work on the subject by Mr. G. G. André,* who frequently uses the terms "art" and "artistic" in reference to the comparative excellence of various ways of getting up plans. The words perhaps are not used with any very definite intention of claiming them as the most suitable expressions; they come readily to hand, though expressions of narrower signification would have met the case. Plans and maps, however complicated in their details, and whatever labour may be expended in working them up to a neat and highly finished appearance, are essentially little more than a collection of conventional signs, the use of which has been tacitly agreed upon for the representation of certain classes of objects or localities. Whatever is worth doing is worth doing well, nevertheless; and it is desirable both that these systems of shorthand should be put upon paper in as intelligible and as neat a way as possible, and also that a uniformity of language, so to speak, should be adopted as far as practicable; so that to those who have to study them, a collection of plans may convey at a glance the information they are intended to give, even without the addition of written commentary to any great extent.

The book before us aims apparently at assisting both these ends; the first ostensibly, the second at all events incidentally. The author's avowed object has been to produce a book "which may claim a place in every drawing-office, be it that of the topographer, the hydrographer, the surveyor, the military, civil, or mechanical engineer, or the architect. Even should he have failed to reach the high mark at which he has aimed, he hopes, with some degree of confidence, that he has at least succeeded in producing a book which the experienced draughtsman will find valuable as a book of reference, and which the pupil may constantly consult with profit." The latter part of this aim has undoubtedly been attained, and the work will be a very useful and instructive one to put into the hands of any beginner in the business of topographical draughtsmanship. The value of such a book to the "experienced draughtsman" will depend a good deal on the extent to which it is, or can be made, a standard of reference for recognised methods of representation, in regard to which there is no real standard at present. Certain things are done in the same way in most plans, but details, such as the representation of slopes and gradients, or of special classes of ground, receive very different treatment from different hands, and in different parts of the country. In the Government drawing-offices, as the author points out, certain mechanical arrangements of shading are specified and adhered to for certain conditions; but it is impossible to ensure uniformity in these things throughout the country, any more than in the method of getting up architectural elevations, unless by a common consent of surveyors and draughtsmen, which it would be very difficult to obtain. And as to the methods of operating, we should doubt whether receipts are of use to any "experienced draughtsman"; because each man has his own way of working derived from his

* The Draughtsman's Handbook of Plan and Map Drawing: including Instructions for the Preparation of Engineering, Architectural, and Mechanical Drawings; with numerous illustrations and coloured examples. By George G. André, C.E., M.S.E. London: E. & F. N. Spon (and New York).

own practical experience, which is, beyond a certain point, the best guide in such matters. As an educational book, however, there is a great deal of information compressed into a small compass; and it may be suggestive also to advanced workers.

A book of this kind has, however, a sufficiently extensive interest, if we consider the great amount of work, of the class to which it refers, which is daily carried on in the country; nor has the subject been so exhausted as to render a few words on it superfluous. The present work is divided into two parts, of which the first is occupied with what its author calls "essential elements," and the second with "applications." Under the first division are comprised "The Drawing Office and Furnishings; Geometrical Problems; Lines, Dots, and their Combinations; Colours; and Shading." In regard to the first section, the author rightly urges the importance of good instruments, if there is to be any good work; and the beginner may be quite sure that there is no worse bargain in the world than a box of cheap drawing-instruments. In details, Mr. André is not always correct. The pencil-point in a bow pencil should *not* be kept exactly the same length as the steel leg, but a trifle shorter, otherwise it cannot be used nearly so fast or so readily without a constant tendency to unsettling the steel leg by the greater pressure of the pencil on the paper. The "centre" must have a firm hold, and the pencil, which traverses the circumference, lean lightly on the paper. Nor is "drawing-paper passed between the nibs" an efficient way of cleaning the pen; it should be blotting-paper, tolerably fine and not too woolly in texture, otherwise it will leave particles behind it. Directions for setting the pen when worn are given; but the young draughtsman will be wise to take the author's advice, and send the pen to a professional doctor for so delicate an operation. Besides, it is a waste of time and labour for a draughtsman to do laboriously and with difficulty that which the practised workman can do so much more quickly and efficiently. A useful hint to the young draughtsman is, that a line should be drawn *from* rather than to the point at which the greatest exactitude is necessary; in drawing radii between the centre and circumference of a circle, for instance, commence your line at the centre. The rest of the directions in this part of the work are not open to question, and the geometrical problems include the delineation of all the necessary geometrical figures.

"Lines, dots, and their combinations" lead us to rather trivial matters, which might be dealt with more shortly and simply. The pupil condemned to "line" a river or a pond on a map may be glad to find his drudgery dignified, and to learn that there is "ample scope in it for the exercise of taste and judgment, and in proportion to the taste displayed, and the judgment exercised, will be the effect of the work when executed." George Herbert thought sweeping a room might be a fine action, if carried out in the right spirit; and we suppose it is the same with shading plans, though the sweeping is the healthier exercise of the two. The delineation of trees is a somewhat less dry operation; but we are shocked at the lax morality indicated in the statement that "the addition of a tree here and there improves the appearance of a drawing." No doubt; but then, where is the typographical accuracy? Henceforth we shall be forced to look with painful suspicion upon the map-draughtsman's tree, placed "here and there."

The chapter on colouring contains useful instruction in regard to a branch of draughtsman's work (we speak, of course, of flat tinting) in which a good deal of care and practice is required to produce a neat and good result. We question the statement, however, that every surface looks better with two washes than one: our experience is that colouring looks best and clearest which is done at once, in one wash; and the waste of time in the double work could only be justified by a very decided superiority in the result. [The principles of plan-colouring are very arbitrary, for while some classes of objects are usually coloured with reference to natural tints, others are as habitually used in an arbitrary and conventional sense. Why, for instance, are roads on plans to be coloured yellow? There is no natural suitability in the colour, and certainly the effect is not pleasing. The scale of colours given for materials in connexion with building agrees tolerably well with the most usual practice, but not altogether: it is not usual nor suitable, for instance, to represent concrete and masonry by the same tint (sepia); tiling is omitted from the schedule; and "Indian red," which makes its best representative, is given to "mahogany," which is a much less important item, in most cases at least. In regard to architectural drawings of the more mechanical type, we may observe that there is much room for improvement in the practice of many offices in colouring; without attempting to make of a plan or elevation a "picture," or give to it what Mr. André would call "artistic effect," there is at least room for securing a certain harmony of tints, and not offending and hurting the eye by those raw combinations of bright red and yellow for brick and timber work which we not unfrequently see. A cardinal rule, Mr. André observes, in the art of map-colouring, is that everything shall be in keeping; "nothing shall unduly obtrude itself; and in a coloured plan, *spottiness*, as it is called, should be studiously avoided. Forest, brushwood, and cultivated land should be represented by tints of about equal intensity, and the same equality may be observed for grass-land, marsh, water, and sand, but the intensity should be less than in the former case." We can scarcely say that the author has realised his own instructions in the small specimen map affixed in the position of a frontispiece to his volume. We should call this, if not exactly a "spotty," at least a very pronounced style of plan colouring, from which we must conclude that the author's predilections are in favour of that heavy manner of getting up plans of this kind, with strong tints and darkly-shaded hills, &c., which has the merit of being clear, and not readily effaceable, but which, we must confess, renders a plan, to our thinking, about as ugly and unattractive a way of covering paper as could well be devised. It is certainly possible to get up coloured plans with much more refinement of effect than is shown in this instance.

The chapter "on shading" gives us the "council of military education" scale of line shading for representing approximately different degrees of inclination, and gives some good suggestions for the filling in of hill-shading; a practice which is of importance as affecting the appearance and the truthfulness of a plan, and which requires some care and patience to ensure a good and truthful effect. Of the two main systems of shading, by lines drawn vertically from the summit to the base of the supposed hill, or by groups of lines, ring-fashion, round it, we should certainly recommend the former, as looking best and presenting least trouble in execution; but the horizontal system may have its advantages when it is intended to add shading as an additional illustration to a system of contour lines.

The "Application" portion of Mr. André's book commences with remarks on the importance of lettering, in regard to scale and style, in which again the illustrations given are little to be recommended as models, though the advice itself is good enough. There is a certain style of lettering titles, &c., peculiar to the map-draughtsman, and of which the specimens given here are only too typical; a kind of ostentatious display of penmanship without a grain of artistic feeling, which is repelling, and at once distinguishes this style of drawing from an architect's drawing. Mr. André's lettering is behind the age, we can assure him. A short method of setting out the smaller divisions of a scale, by which any approximate opening of the compasses is made to achieve the object, without repeated trials, is worth the draughtsman's attention (p. 71), and may save him many settings of his "hair-trigger." As a general rule, we dislike the elaboration of scales, with mock tablets, borderings, and flourishes (which again are typical of the map draughtsman); the scale should not be obtrusive, and it is waste of time to set about ornamenting it ostentatiously. Perhaps the same may be said of titles, which on architectural drawings are often to be seen carried to an almost absurd extent of intricacy and laborious trifling.

The observations, at some length, on plotting surveys, give clearly the main points to be attended to. The statement that in a survey, "owing to the inequalities of the ground, all measured lines are liable to be recorded a little too long," seems to ignore the unquestionable fact that a practised and careful hand will take note of and allow for these, as may seem requisite, in the process of chaining. The surveyor should not be content with taking the chain over the ground just as it comes, and then allowing a percentage for error; he should accustom himself to notice the lie of each chain, and allow slightly for inequalities in planting his "arrow"; by careful attention to this complete accuracy may be attained even after going over very broken ground, and "stepping" the chain up and down hill.

Map-drawing, especially the sketching and subsequent delineation of the contours of hills, is carefully described; in obtaining the general contour and proportion of a hill, the author recommends a station on the summit, and the approximate sketching of two or three contour lines, commencing with the base, as the ground-work for a more detailed survey; "a skeleton," as he terms it, "of horizontal curves numbered as to inclination and heights. . . . The greatest difficulties to be overcome in eye sketching are,—1st, that of converting a perspective view into a plan; and 2nd, in forming a just conception of the intersections of different slopes *at their bases*. Hence the rule to project first upon a sketch all the lowest lines or watercourses, and then the highest parts or summits." The chapter on mechanical and architectural drawings, on the other hand, is very deficient, so far as these latter are concerned, and we may safely say that the example of a coloured perspective sketch (plate 24) is *not* "such as are frequently made by architects" nor by any means requiring "high skill and taste" on the part of the colourist. The author has gone "beyond his last," and is writing of what he has evidently very partial knowledge of. A remark as to the effect, in geometrical and mechanical drawings, of a sharp white line left at each angle between the line and the colouring, is true; it should, however, be on one side and at the top, only, of each surface of colour: representing, in fact, the opposite of what is sometimes called "dark-lining." Some of the French architects obtain this effect in a shorter and simpler way than that recommended by Mr. André, by taking off the colour at the edge with the point of a sharp knife; this produces an admirable effect, bright and yet not hard, in application to the jointing of masonry,—just picking out the arrisses which are supposed to catch the light.

The specimens of map-drawing, especially of characterising detail, among the plates at the end of the book, are much better and finer in style than the frontispiece drawing, and give specimens of a method of indicating nearly every kind of ground and of natural object. So far as this part of the subject goes, Mr. André's book can be fully recommended; but in regard to architect's draughtsmanship there is little to be said for it, and its author has claimed for it a larger sphere of usefulness than it is likely to have. But as a surveying draughtsman's guide it will be very useful, and has been got up with care and attention.

THE DECORATION OF ST. PAUL'S.

At a meeting of the executive committee on the 27th of November, the Dean of St. Paul's read the resolutions adopted by the Chapter, which were as follow:—

"That, though the Dean and Chapter have given a general approval to the designs submitted by Mr. Burges, they think that, considering the divided state of opinion in the Executive Committee, and also in their own body, it is desirable to suspend for the present any attempt to proceed with the decoration of the cathedral. They recommend that steps should be taken for rescinding the agreement with Messrs. Burges & Penrose, which has been found to be highly inconvenient in its working. They hope that the committee, in dealing with Mr. Burges, will treat him with the liberality to which, in their judgment, his professional eminence and his services alike entitle him. That, subject to the expression of an adverse opinion in the Executive Committee, the Dean and Chapter deem it advisable to withdraw the permission given by them on the 21st of July, that temporary experiments should be made on the walls of the apse of the cathedral, with a view to illustrate the effect of Mr. Burges's plans. That these resolutions be communicated by the Dean to the Executive Committee."

Mr. Beresford Hope, M.P., then proposed, and Mr. W. Longman seconded, the following resolution:—

"1. That this Committee, in compliance with the resolution passed by the Chapter of St. Paul's on the 3rd of November, agree to suspend for the present the work of the decoration of St. Paul's; 2, that this committee will not press the experimental painting of the apse; 3, that this Committee is of opinion that the rescinding or revising the agreement with Mr. Burges should also, for the present, be postponed."

Mr. Walter, M.P., speaking from his own dearly-bought experience, was of opinion that when matters had got into such a difficulty as that in which the decoration of St. Paul's was at present, the only course was to get rid of the architect and to start again entirely free.

Sir Gilbert Scott, R.A., considered it unfair that Mr. Burges's engagement should be entirely

cancelled, and would vote for Mr. Beresford Hope's motion.

Mr. G. Cavendish Bentinck then moved an amendment to the motion as follows:—

"To leave out the last paragraph following the word 'Apse,' in order to add the words, 'And this Committee is of opinion that steps should forthwith be taken for rescinding the agreement with Messrs. Burges & Penrose.'"

Ultimately, however, the following resolution, proposed by the Dean and seconded by Canon Gregory, was carried by a majority of nine to four:—

"The Committee agree to comply with the recommendation of the Dean and Chapter of St. Paul's, that steps should be taken for rescinding that agreement with Messrs. Burges & Penrose, which has been found to be highly inconvenient in its working."

It was then proposed by the Dean, seconded by Mr. Longman, and carried unanimously, that "the question of Mr. Burges's remuneration for work hitherto done be referred to the finance committee."

A fuller report of the proceedings, together with the copy of a letter addressed to the Dean by Mr. Burges, will be found in the *Times* of November 28.

Mr. Bentinck has published a letter to show that Mr. Burges, in the designs he submitted, has not adopted, as instructed, "the style of the best Italian architects and artists of the sixteenth century."*

THE LATE MR. GEORGE GUTCH.

Mr. Gutch, whose much-lamented death we mentioned in our last, was the son of the late Rev. John Gutch, formerly rector of St. Clement's, and Registrar of the University of Oxford. He was pupil and assistant to Mr. George Saunders, architect and chairman of the Commissioners of Sewers for Westminster and part of the county of Middlesex, who designed and built the elegant suite of sculpture galleries at the Old British Museum, then Montague House, for the reception of the Townley collection of marbles, and who had the revision of the building accounts for the erection of Somerset House. Under this master Mr. Gutch acquired great practical knowledge, and through the influence of Mr. Saunders as a county magistrate, was appointed to the district of Paddington under the powers of the old Building Act of George III., and which he held for upwards of fifty years. He was also eventually surveyor to the extensive building estate of the bishopric of London in the same parish, and it was under his superintendence that this important quarter of the metropolis has been covered. Mr. Gutch was highly esteemed by his friends and colleagues for his honourable character and genial manners, and was ever ready to assist his professional brethren in any difficulties, and to relieve the wants of the poor or unhappy by his benevolence. He was in his 84th year, and was buried in Paddington Cemetery.

HOW FEVER IS PROPAGATED.

On the 27th of November Dr. Hardwicke, the coroner for Central Middlesex, held an inquest at the Sun Tavern, Gray's Inn-road, touching the death of William Stone, aged fifty-four, of 2, Leopard's-court, Baldwin's-garden, Holborn.

In the course of the inquiry,—

Mr. Francis H. Birch, relieving officer, stated that he visited the house, and in a second-floor he found two bedsteads. On the first bed was a young woman, aged 19, and a child 20 months old. On the other one, the other side of the room, were three children, aged 11, 9, and 6 years. All had the fever. The deceased said he thought the fever was from the stench of the house, and that the dust had not been removed for two months. There was no cover to the water-cistern, no water on at the closet, no traps to the sinks, and the windows would not let down from the tops. He reported the case to the sanitary officers, but the room had not been disinfected, nor anything done.

The Coroner said it was a fearful thing to find a case like this, where there were four children with fever, and the father of them, through ignorance or neglect, not going to the parish for proper nourishment for them, and likewise himself going to work, running the risk of carrying the fever to a house where he was at work. Cisterns should all have covers, for water draws all the smell to it.

The jury returned a verdict that the deceased expired from fever, or blood poisoning, accelerated by the unsanitary condition of the house, and want of proper nourishment.

PROJECTED IMPROVEMENTS AT THE ANGEL, ISLINGTON.

Sir,—I would advocate as an essential feature in this improvement, the desirability of commencing with the house next the Philharmonic, on the Islington side, and the removal of the entire block of houses (all of an inferior character), thence to a point of junction with the main line of houses in the City-road, approaching by a suitable curvilinear line: this alone would relieve the enormous down side traffic.

Nunc aut Nunquam.

THE PROPOSED PUBLIC LIBRARY AT BETHNAL-GREEN.

Mr. J. Hall, one of the members of the Bethnal-green Vestry, has not a very favourable opinion of the industrial habits of the labouring population in that district. During the discussion of the proposal to adopt the Free Libraries Act at the meeting of the Board last week, it was strongly opposed by Mr. Hall, who remarked that "every one knew that workpeople now could scarcely be got to work three days a week, and if they had a free library to go to, he doubted if they would work at all, but fluctuate between the library and the workhouse, enjoying free literature and free living." The Vestry were, however, almost unanimously in favour of the project, a resolution to call a public meeting on the subject being carried *nem. con.*, a committee being appointed, with instructions, before holding such meeting, to place themselves in communication with the authorities of the South Kensington Museum, with a view to ascertain whether the public library could not be connected with the Art Library and School of Design, which the Government has undertaken to establish at the Bethnal-green Museum.

SCHOOLS OF SCIENCE AND ART.

City School of Art.—On Monday evening, the 30th ult., the annual distribution of prizes awarded by the Department of Science and Art and by the School Committee took place in the Bishopsgate Schools, Skinner-street. This institution is one of the oldest in London, having been established in 1841. There are now in the school 120 students, mostly artizans. The chairman (the Rev. W. Rogers, rector of St. Botolph's) said that the school was originally intended for artizans in the silk trade. The importance of learning drawing was obvious, but it was desirable to combine the study of science with art. Lord Henry Lennox, who distributed the prizes, said he was convinced that the expenses of the country must be enlarged for the purpose of increasing art and technical knowledge, if our citizens were to compete in beauty of design with Continental artizans, in taste and ornament as well as in superior workmanship.

Oxford School of Science and Art.—The annual distribution of prizes to the successful students of the Oxford School of Science and Art took place on Saturday evening, 21st ult., in the Town-hall, Oxford, in the presence of a numerous and influential assembly. Prince Leopold had promised to distribute the prizes, but through ill health was compelled to decline, and Dr. Acland, Regius Professor of Medicine in the University, who had expressed his willingness to supply the vacancy, was absent through having been bitten by a dog. The Dean of Christ Church, Dr. Liddell, therefore, presided. Mr. Gamlen (secretary) said the committee were of opinion that the school could not, for the present at least, be maintained without an annual subscription of 60*l.* The number of persons who attended the art classes and received instruction in drawing during the session was 109, of whom twenty-four were students at the day classes, and the remaining eighty-five at the evening classes. The total number of students in the science classes was 155, as compared with 105 last year; the number presenting themselves for examination was 100 (last year eighty-seven). These 100 candidates gained in all 140 successes at the examinations in May last, sixteen in the advanced stage, and 124 in the elementary stage. Dr. Liddell, in the course of his remarks, read some extracts from Professor Acland's intended address, as follows:—The science departments of the nation at large available for teaching the working-classes were twenty-five years ago only in progress of formation. The Great Exhibition of 1851, the fruit of the sagacity and patriotism of the Prince Consort, fixed public attention on what are, in the present state of the civilised world, the foundations of manufacturing skill. A great educational department was begun. The Museum of South Kensington, the offspring of this development, though not even yet fully consolidated, receives from the public purse 250,000*l.* annually, directs art-studies in over 2,000 elementary schools and in 124 schools of art. Science-studies are conducted in 1,182 schools. There are in the country more than 350,000 students of science and of art. Of the twenty-three scientific subjects in which the Privy Council contributes aid, there are hardly any which, besides their intrinsic value, do not contribute largely to the understanding of practical art. For improving some trades the highest qualities of thought are demanded. Building in all its departments may be classed under this head. It would be superfluous to point out what an endless variety of mathematical, chemical, and metallurgic principles are hourly brought before the mind of an intelligent railway engineer. The technical applications of careful drawing are of course as numerous as are trades and professions. In the making of drawings, or in the copying of designs, all the manufactures and trades in short, in which decorative as well as mechanical skill is called out, a delicate appreciation of the natural world, of beauty, of form, and of colour, and of composition or grouping is eminently required. The prizes were then distributed, each recipient getting a few words of encouragement from the Dean.

Carlisle School of Art.—On Wednesday evening, 25th ult., the annual meeting and distribution of prizes in connexion with this School of Art was held in the Schoolroom, Fisher-street, in this city. The Mayor of Carlisle presided. The report of the committee stated that the school had been doing good work. "In the second grade examination in freehand, geometry, perspective, and model drawings, seven have obtained prizes, and thirty-two certificates of merit. In the third grade, eight prizes of books were awarded; one free student has been appointed, and one full certificate gained. 707 works from this school were also sent to London for examination. The committee have this year offered prizes for the best paintings of a group in oil or water colour, open to all the students in the school, and the result has been the production of some very creditable paintings."

A GAUGE FOR SPECULATIVE BUILDERS OF WORKMEN'S HOUSES.

Some speculative builders at Hawick, Scotland, have solved the question as to the remunerative nature of cheap workmen's dwellings; and, at a public sale last week, it was found that the houses sold readily, and considerably above the upset price.

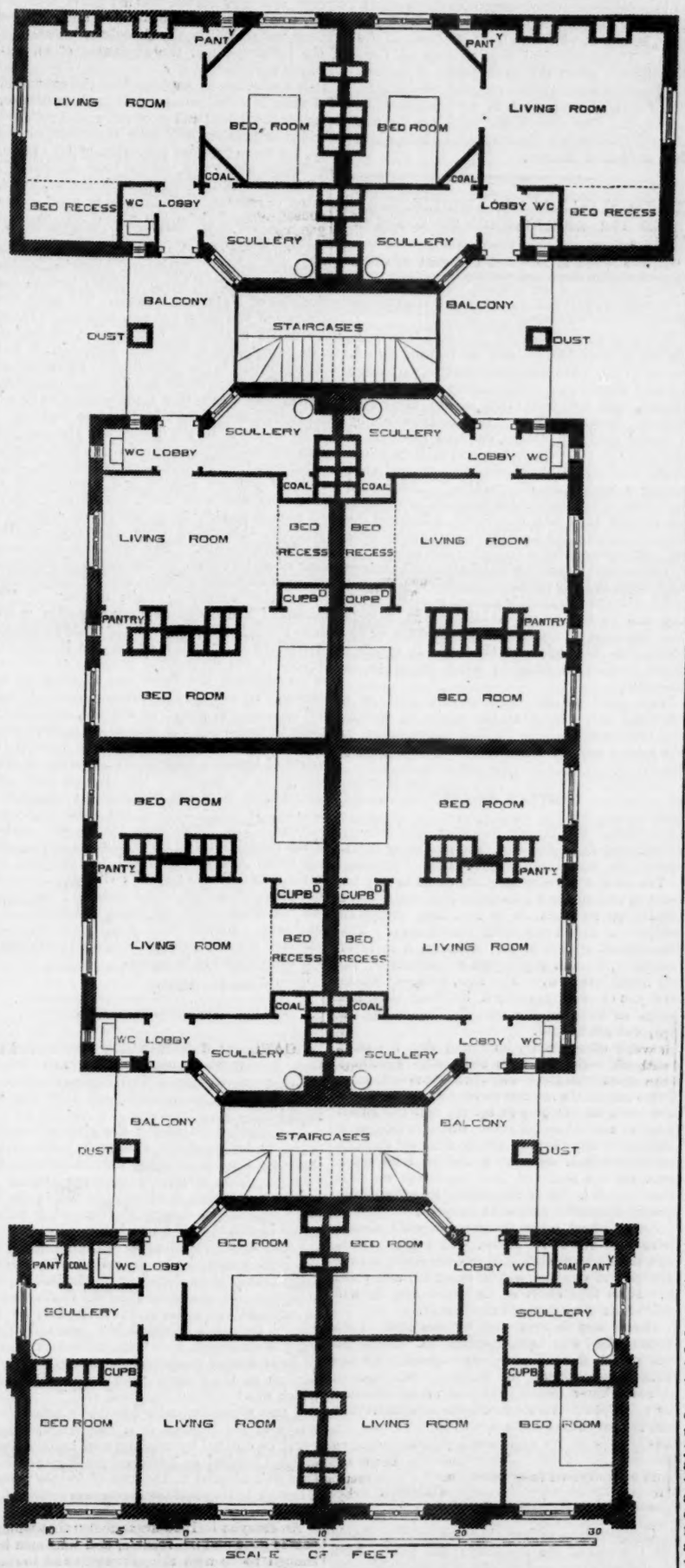
The first block offered was a block of twenty "quarter houses" in concrete. The houses on the ground-floor, which consist of two rooms, were offered at the upset price of 95*l.*, and brought from 109*l.* to 110*l.* Those on the upper floor, which have attics in addition to two rooms, were put up at 130*l.*, and brought 147*l.*

Four half-concrete houses, containing double the extent of accommodation of the others, were offered at an upset of 300*l.*, and sold for that sum.

Four "quarter houses" of stone and lime, on the upper floors, were offered and sold at 190*l.* The ground-floor houses in the same block were offered at the upset of 135*l.*, and sold for 141*l.* Thirty-two houses were offered and sold directly to intended tenants and working men. Attached to each is about a rood of garden-ground.

A Hundred Accidents at One Building.—Building in Italy would seem to be a peculiarly dangerous occupation. A new office is being erected in Rome for the Ministry of Finance. The other day a workman fell from the scaffolding and was killed, making, it is asserted, the hundredth victim of accidents upon the same building.

* The Completion of St. Paul's. A Letter to the Very Rev. the Dean of St. Paul's, Chairman of the Executive Committee. London: Harrison & Sons, St. Martin's-lane.



PLAN OF THE NEW BUILDINGS IN THE FARRINGDON ROAD,

For the Metropolitan Association for Improving the Dwellings of the Industrious Classes.

NEW BUILDINGS, FARRINGDON ROAD,

FOR THE METROPOLITAN ASSOCIATION FOR IMPROVING THE DWELLINGS OF THE INDUSTRIOUS CLASSES.

THESE new buildings were formally opened, as we mentioned, by Mr. Cross, the Home Secretary, on Friday, the 13th of November. They consist of five blocks of buildings seven stories in height, erected upon a plot of land having a frontage of about 300 ft. to the Farringdon-road, and an average depth of about 160 ft. The original idea was to erect one long range of double buildings facing the Farringdon-road on one side and a large courtyard on the other. This was, however, abandoned in favour of the present scheme of five blocks at right angles to the Farringdon-road. The advantages claimed for this arrangement are:—(1) The subdivision of paved courtyards which serve as playgrounds; (2) the equalising the aspect of the several sets of rooms; for in the original idea one-half the dwellings would have looked on the road, and the other half on to the old buildings on the side: now all the dwellings get a glimpse of the road, and are as far as aspect is concerned on an equality; (3) economy of space, for in the first plan accommodation would have been obtained for dwellings equal in extent to only three of the present blocks; (4) the reduction of spread of fire.

Having determined upon the position of the blocks, the next step was to determine the principle which should be worked out. The two ideas which were kept steadily in view in working out the plans were,—(1) That each dwelling should be complete in itself; and (2) that privacy should as far as possible be obtained for each dwelling. Of course the general idea of a gallery-plan first presented itself, but the two serious objections to this arrangement are—(1) Diminution of light by the overhanging galleries; and (2) entire want of privacy. This idea was therefore abandoned. There were also objections to what is known as the external staircase plan, especially when carried out in double sets of dwellings. After mature consideration the plan adopted was submitted to the Directors of the Company as embodying three important advantages:—(1) Complete privacy ensured by what may be called the balcony plan, whereby the staircase is continuous from bottom to top without the necessity of a visitor passing a single doorway; in other words, no doorway opens on to a public passageway; (2) completeness in each set of rooms; and (3) ventilation through the blocks; to which might really be added a 4th, namely, the spread of fire being reduced to a minimum, and the access from any floor remaining intact.

The general idea being thus settled, it was obvious that the scheme, to be successful, should include dwellings of various sizes, and as the irregular form of the back boundary rendered it necessary to have the blocks of various lengths, it became easy so to arrange the plans as to obtain the required diversity in the accommodation. It was, however, determined, that whatever the total accommodation might be, each dwelling should have a small scullery, fitted with grate, copper, sink, and coal-place, and a water-closet, approached in all cases from the entrance-lobby, and not in any case from a room. The accommodation provided includes the following arrangements:—

1, a living-room with bed-niche; 2, a living-room with one bedroom; 3, a living-room with bed-niche and one bedroom; 4, a living-room with two bed-rooms; 5, a living-room with bed-niche and two bedrooms.

In every instance, attached to the foregoing accommodation is a scullery, &c., as before described; also a small pantry; and in every case the water-closet has a window opening to the open air. The rents of these various sets vary from 4s. 9d. to 10s. per week.

As regards construction, the walls are built of stock bricks, with red brick bands. The floors throughout are constructed with rolled iron joists embedded in concrete made of gas-breeze and Portland cement, of which materials all windows and door-heads and steps are made. In all cases the floors of living and bed rooms are covered with boarding on joists. The roofs are flat, laid with Val de Travers asphalte, and serve as drying-grounds. The soil-pipes are of stoneware, and run up in a straight line from the drain to the roof, whence they are continued to a further height of about 10 ft. in iron. The closet-trap on each floor, and the surface water-trap on roof, communicate by a junction with the soil-pipe. In the centre of each balcony is

a dust-shaft, with an iron self-closing door on each floor.

The buildings find tenants, we are informed, as soon as finished.

We give a plan of one of the blocks. On the ground-floor next the high-road some shops are provided.

The total cost of the five blocks, including the paving of the courts between the blocks is a little under 40,000*l.*

The architect is Mr. Fred. Chambers, of Finsbury-circus; the builder, Mr. James Brown, of Finsbury-pavement.

ESSENTIALS IN CONGREGATIONAL CHURCH BUILDING,

FROM THE MINISTER'S POINT OF VIEW.

Dr. Henry Allon gave the following notes to the seven architects who are to send in designs for rebuilding Union Chapel, Islington:—

The two great essentials of a Congregational Church Building are:—Adaptation (1) for *Preaching*, and (2) for Worship *of the Congregation*.

I. *Preaching.*—In Congregational services the sermon is longer and more prominent than in Episcopal services. It is essential, therefore, that every person should see and hear the preacher, without conscious effort. Hence (1) there must be no obstruction to seeing—of internal supports, intercepting lights, lights on wrong levels, &c.; and (2) the acoustic properties of the building are of fundamental importance; the form of the structure, and especially of the roof, should be specially considered and adapted for hearing. The sermon must be heard *without strain*, either of the ears of the auditory or of the voice of the preacher. It seriously interferes with impression for the hearer to be consciously making an effort to catch the preacher's words; and with effectiveness for the preacher to be solicitously straining to make himself heard. No preacher can *always* speak on the strain through a sermon of forty or forty-five minutes. It therefore follows (3) that the preacher must be in vital contact with his hearers. Eloquence, as has been justly said, is in the audience; the preacher's inspiration is not his theme only, but also the manifest sympathy with it—the kindling eyes and interested countenances of the people. If, therefore, he is separated from them by any such space as disables him from easily catching these, his inspiration must be entirely subjective, and necessarily partial. Hence, the height of the pulpit, and its distance from the nearest pews on the ground-floor, as also in the gallery, should be reduced as much as possible. The galleries should also be constructed at such an angle as will enable persons in the back pews easily to see the preacher. In many churches the preacher sees and is seen by only the front row. Sufficient space round the pulpit and table-pews must, however, be provided for weddings.

II. *Worship.*—(1) *Prayer* in Congregational churches is not Liturgical, but *Extemporaneous*. Hence, whatever necessity there may be for easily hearing preaching, it exists with still greater emphasis for easily hearing prayer. The preacher may be loud in addressing an audience; he who prays cannot shout in addressing the Almighty. The devotional feeling of the congregation is seriously disturbed and hindered, when it is necessary to strain the ear to catch the words of extemporaneous prayer. Where Liturgical prayer is used, familiarity with the prayers that the preacher reads renders it much less important that he should be articulately heard. Thus, except during singing, the congregation *through the entire service* are dependent upon hearing the words of the minister. (2) *Worship* is not choral, but *Congregational*. No hymn, chant, or anthem is sung in which the congregation does not join. The idea, very largely realised in Union Chapel, is that the whole congregation shall sing from music-books in four-part harmony. The choir, technically so called, is therefore only part of the singing congregation; its function is simply to lead it. It should therefore be in it, and of it—under no circumstances separated from it. It should be felt in its lead, and control of the Congregational song, but not seen or even heard apart from it. Hence it should be so placed as to be part of the congregation. The great attainments in musical worship of the present congregation are, in my judgment, to be chiefly attributed to this arrangement, and could not be realised with a separate choir in a choir gallery; for which, consciously or unconsciously, the congregation listens. The choir must of course be contiguous to the organ, and in possible communication with the organist. If, by any projection of the manuals of the organ, he can be placed in front of them, all the better. These practical requirements of Congregational services are so essential, that, however desirable architectural congruity and artistic beauty may be, they must, in my judgment, be paramount. Our church buildings are for use, not for the realisation of conventional ideas, which often unfit them for use.

THE STUDY OF ANCIENT ARCHITECTURE, AND ITS APPLICATION TO MODERN USE.*

"It were indeed to be wished that some invariable standard could be discovered, whereby to decide the merit of every production of art."—Wren.

"In truth, we want rather art than stuff to satisfy our greatest fancies."—Freart.

It is now well understood that no advance in the art of architecture can be realised by adhering to one particular order or style, perfection must be sought by a careful study of many examples, and not from that of an individual nature. Stewart tells us, "that imagination, by a careful study of nature, employs one part of her works to correct another, and collects into a single ideal object, the charms that are scattered among a multitude of realities." As regard sculpture and painting, this method of proceeding has always been the rule which influenced the ancient artists; the Greeks, in particular, were eminently successful in enforcing this point.

The several examples of Classic architecture vary much in their relative proportions; the art is not advanced by strictly adhering to or copying any one pattern; the architect who selects beauties from all, and avoids peculiarities, or defects, will best advance the art. It requires great caution in deciding what ought to be imitated.

The mind of an architect enriched by a profound knowledge of all the works of ancient and modern art, will be fruitful in proportion to the labour and care bestowed in investigating them.

Rejecting the works of past ages, and ignoring all precedent, would be a retrograde movement, and actually placing each generation in a state of infancy. Sir Joshua Reynolds has forcibly shown that real genius is only gained by building on the past. Nothing can come of nothing.

The idea of constructing buildings to last for ever, is absurd; but I do think that our edifices should be so built as to last long enough to educate a few succeeding generations. The triumphant appeal of an Irishman, a lover of antiquity, who, in urging the superiority of the old architecture over the new, said,—"Where will you find any modern building that has lasted so long as the ancient?"—although a bull, was not so bad.

It will consequently be found that the most successful architects were those who were best acquainted with the works of their predecessors. Exact imitations are not to be made; the architect must imitate only in spirit; and the knowledge of ancient architecture, which is diligently sought in early days, should be retained through his professional career. A settled intercourse with all the best and most important works is thus secured. It is impossible to successfully design unless this course be adopted.

An architect, when designing, should always have a master at his elbow. He ought to consult the greatest authority in each style, not for the sake of copying, but he must try and excel it. If he falls short of its excellence, he will still attain a respectable mediocrity.

Greek and Roman architecture have been both studied with equal application. These are not practised with sufficient regularity by the French,—or, indeed, the English,—who seldom or never know either grammar or architecture by principles. Although classic architecture is not the prevailing fashion, still it

"Must stand acknowledged, while the world shall stand."
Cowper.

And be compared to—

"Flowers,
That never will in other climate grow."
Milton.

Compositions, rather than inventions, should be the aim of the architect; the heaven-born genius only can produce absolute novelties. No immortality can be gained by producing wild, new-fangled, and licentious designs, which proceed from a morbid thirst of creating new objects and new forms, having parts without unity, magnificence without order, and richness without taste, exciting the ridicule and contempt of the judicious, and the applauses of an unthinking multitude.

It is a mistake to suppose that the execution of a work in valuable materials, such as bronze, brass, or the richest and most variegated polished marbles, or granites, will ever supersede, or vie with, the more precious properties of true taste, based upon proportion, natural form, and beauty, exhibited in mean materials, such as clay, brick, plaster, or cement. It is the soul or mind in the work that should claim the admiration, and not the material.

The mixtures of styles will never create a new and perfect style of architecture. All such attempts have signally failed, being contrary both to the principles of Nature and reason. The mule, the offspring of the horse and ass, may be, as far as regards its anatomical construction, as perfect as its parents, yet in form and proportion is but a mongrel, and is not permitted to reproduce its species. The same result has always been realised when attempts have been made to combine Greek and Gothic architecture in the same building.

The architect of the period will also not progress without seeking the aid of positive science, as deduced from metaphysical philosophy. The origin of positive science has been traced to philosophy, and with much reason, as "out of evil cometh good." Thus, astronomy came from astrology,—chemistry from alchemy,—physiology from auguries. The architect must steer clear of stylarianism, as the relics of past ages, although advisable to study, are fast disappearing before the advancing light of reason. The current of knowledge and improvement rushes on so strongly that they who hesitate to commit themselves to it will soon be left behind, and serve only the disgraceful purpose of enabling us to measure the force and rapidity of the stream. By science the architect learns to control one natural power by another, and often to guide to a salutary end that which appears most threatening. Thus it teaches him to alter the course of heaven's destructive lightning, to stem the power of water so that it may serve our purposes, to sway the consuming operations of fire, and to force from it the most important services. The revolutions, places, and periods of the celestial bodies serve him for distinguishing times and seasons, and for dividing the world into different regions; the meteors afford him prognostications of the weather; the winds sail our ships, drive our mills, and move other machines. Empedocles's magic was only the profound knowledge he had acquired in whatever was most abstruse in nature.

Still,—

"Nature and art, indeed, have bounds assign'd,
And only forms to things, not beings, give."
Pomfret.

In the works of nature utility appears to have been the primary consideration, and beauty rather a result than a first cause; as Juvenal says, "Wisdom and nature, are they not the same?"

In designing an edifice, the plan and section ought to be carefully contrived prior to the elevation, the latter being dependent upon the former. The peacock's plumage would ill become a domestic fowl and *vice versâ*; for the same reason the decorated front of a palace would ill suit that of a warehouse. By studying the wonderful formation of natural objects, the architect would derive more instructive knowledge than is to be found in all the buildings of antiquity. It is well to recollect that although an architect is a designer or creator, he has mental materials afforded him, not only from antique examples, but from nature; and after all he is merely a compiler compared with the wisdom of the Creator, who formed the earth, which was "without form and void."

A new style may arise from the constructional wants of the present or a future age, but can never be created by masking new buildings with either Classical or Mediæval architecture, however well adapted to the uses of former periods, although having nothing in common with modern requirements.

An essayist in 1625 urges that "that which is past is gone and irrevocable, and wise men have enough to do with things present and to come; therefore they do but trifle and disturb themselves to no purpose who labour in past matters." An architect cannot endorse the above, as the works of our ancestors are full of instruction.

* By Mr. W. Pettit Griffith, F.S.A. Read before the Liverpool Architectural Society, December 2nd inst.

New styles and new inventions may be compared to new wine; they must be tested by time before they can be appreciated. It requires the comparative experience of ages to determine what is most durably satisfactory in the works of art,

"And only likes what death has made divine."

Bishop Kennett, who formed an antiquarian and historical library for a cathedral church, and deposited it in Peterborough Cathedral, says "that of all things history is least understood by the generality of mankind, and, what is very strange, people are for the most part least able to judge of the history of their own times. They have a partiality to one side and a prejudice to another; they have their presumptions and their conjections, and, like some distempered heads, have a sight so uncertain that it deceives them more than blindness itself could do."

It is not many years since that all who were unread in the writings of Vitruvius were hardly deemed worthy to rank with qualified professors.

There can be but one opinion regarding the origin of Grecian architecture, Vitruvius's romantic stories, although amusing, require no serious refutation; if Assyrian and Egyptian architecture had never existed our attention might have been arrested by trunks of trees suggesting columns, &c.

The history of architecture has still to be written to be of any value to the architect. The origin of the Doric order, given by Sir W. Chambers in bad perspective, as derived from trunks of trees, with flat stones or slates on the top, having the spaces between the ends of the joists closed with clay, wax, &c., and the ends of the joists covered with thin boards, cut in the manner of triglyphs, is not only improbable and absurd, but there is no authority for anything of the kind; the Greeks borrowed their ideas from buildings of stone, not from those of wood; they simply refined and reduced to order the works of former ages; this they accomplished with consummate ability.

It has been recently asserted by an eminent architect in his lectures at the Royal Academy, that Greek architecture was in the main of spontaneous growth, the Doric being strictly and absolutely Greek. It was universally believed by the ancient philosophers that insects were spontaneously generated from putrefying substances, an opinion now only maintained by uninformed persons. We have likewise no spontaneous creations of architecture.

Art did not spring up to perfection, but gradually rose. The sculpture of Greece was the growth of years until Phidias carried it to the point beyond which it could not go.

Egyptian architecture offered to the Greeks many ideas. On the Egyptian temple may be traced the germ of the triglyph. This may be seen in the entablature, a series of six reeds parallel to each other from top to bottom, *i. e.* perpendicularly and placed similarly to the Greek triglyphs, at a certain distance apart. The reeds are convex, so are the drops in the Greek. Vitruvius, for many years the text-book in the Royal Academy, is now very properly repudiated; although the oldest professional work extant, it is exceedingly incorrect and mostly fabulous. The origin of the Corinthian capital may be cited as one instance, among others, whose type may be clearly observed in many of the Egyptian capitals, in which the lotus and palm-tree were used, and even volutes were employed.

Sir G. Wilkinson has shown, in his "Ancient Egyptians," vol. iii., p. 310, that by removing the upper part of the lotus-bud capital, and bringing down the abacus, it presents the Grecian Doric capital. Fluted columns were also used by the ancient Egyptians. Sir C. Barry noticed polygonal columns of sixteen sides in a temple at Eluthias.

Assyria, also, supplied the Grecian architect with brain material, not in wood, but in stone; the germ of the honeysuckle, Ionic volute, polygonal columns, foliated bosses, &c., may be named.

No doubt, in primitive times, when mankind lived in woods, upright trunks of trees were employed to form huts, with large beams placed on the upward trunks; the Greek architects, however, with a knowledge of all the buildings of stone in Egypt and other countries, never could have had recourse to the huts of barbarians for their ideas.

In the foregoing paper Gothic architecture is not included. Architects of the antique school did not recognise the Gothic,—they ignored it; of course, through not understanding it, Mediæval architecture has many incongruities, seriously, but amusingly, pointed out by Evelyn; he terms it a certain fantastical and licentious manner of building, called modern or Gothic; congestions of heavy, dark, melancholy, and monkish piles, with slender and misquine pillars, with trite and busy carvings, full of fret, lame statues, sharp angles, jetties, lace, and other cut-work, and crinkle-crankle, clumsy buttresses, nonsense insertions of various marbles impertinently placed, turrets and pinnacles thick-set with monkeys and chymæras. Although not treating of this style of architecture on the present occasion, nor endorsing Evelyn's very flattering description of it, it may be observed that the Classic or Antique architecture possesses deformities quite equal and more unnatural than many in the Gothic style,—such as centaurs, satyrs, ox-sculls, termini, &c. There is no doubt that Classic and Gothic architecture, when used, can be rendered more beautiful by the omission of the above-named vagaries.

True taste or beauty in design cannot exist in a building excessively loaded with statues, canopies, saints in niches, emblems, finials, bas-reliefs, flowers, and other gorgeous decorations, without a foot of plain surface to be seen in the whole front.

In the present period but little time is devoted to study, and one of the greatest signs of its absence is the growing love for colour in lieu of form. The first ideas of beauty are derived from colour,—in infancy the mind is pleased with brilliant colouring long before it perceives form. The raw countryman is delighted with colours. Addison says, "the eye takes most delight in colours." Stewart enforces that "from the admiration of colours the eye gradually advances to that of form; beginning first with such as are most obviously regular. Hence the pleasure which children, almost without exception, express when they see gardens laid out after the Dutch manner; and hence the justness of the epithet, childish or puerile, which is commonly employed to characterise this species of taste; one of the earliest stages of it progress, both in individuals and in nations." The same love of regular forms, and of uniform arrangements, continues to influence powerfully, in the maturity of reason and experience, the judgments we pronounce on all works of human art, where regularity and uniformity do not interfere with purposes of utility.

Much has been written on uniformity, and it undoubtedly is a component part of building. To give two towers to a church, one containing a belfry and the other a vacuum, is an evident absurdity. If one tower be placed in the centre the uniformity is preserved.

Uniformity has always been considered a *sine quâ non* in beauty. A popular poet in 1736, says:—

"Near some fair town I'd have a private seat,
Built uniform, not little, nor too great;
It should within no other things contain,
But what are useful, necessary, plain;
Methinks 'tis nauceous, and I'd ne'er endure
The needless pomp of gaudy furniture."

This uniformity, considered to be so essential by many, has been denounced by a powerful writer. True,—

"Stones upon stones the orator has piled
With swelling words, but words will build no walls."
CRATINUS.

This writer's argument is, that if one part always answers accurately to another part, it is sure to be a bad building; and the greater and more conspicuous the irregularities, the greater the chances are that it is a good one. Many edifices on the Continent prove the absurdity of supposing that simplicity and uniformity are incompatible with the rich diversity of Mediæval architecture. In some buildings the symmetry is destroyed by intentional irregularities, as in Strasburg Cathedral, but it is quite an exception to the general practice. In Gothic buildings generally a severe regularity and uniformity is observed, and the strictest harmony of design may be traced throughout the copious and luxuriant decorations. Schlegel asserts that instances of intentional neglect of symmetrical proportions are rare exceptions; for Gothic architecture is no less governed by laws of symmetry than that of the Greeks.

Finally, it may be regarded as an undoubted fact, whatever may be urged to the contrary, that uniformity if not always the result of utility, is closely allied to beauty. And further that a careful observer of the varied works of nature will not hesitate to admit this as a rule. It has been wisely said by Oersted, that the remembrance of the glorious times of old, and the hope of a richer future, are all the present age can give to art; but dwelling with these thoughts, apart from external influences, the knowledge of the beautiful may yet be guarded in some faithful hearts, and though no living chords may now respond to theirs, time must at length give a new impulse to the soul, and sublimity and beauty once more become attainable.

THE PRINCIPLES OF DRAWING, GEOMETRY, AND COLOUR, AS TAUGHT AMONGST THE HINDOOS.

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the last meeting of this association held in the rooms, 37, George-street, a paper was read by Alex. Hunter, M.D., on "The Principles of Drawing, Geometry, and Colour as taught amongst the Hindoos." Geometry, said the reader, has been cultivated for many centuries in India, both among Hindoos and Mahomedans as a branch of science as well as a necessary element of education. The theory as well as the practice has been thoroughly understood by the educated natives, and the principles upon which it has been taught, not so much in schools as in the domestic circle, prove that geometry has had an importance assigned to it in former times by enlightened minds who foresaw that it might be made the means of improving the taste and diverting it to the study of simple and beautiful forms. The mode of teaching geometry to children is very simple and impressive, and the materials employed are of the cheapest. A Hindoo child is first taught to draw with the points of the fingers on the floor covered with sand to the thickness of half an inch. The surface of the sand is made level with a straight piece of wood or a piece of split bamboo. Dots or depressions are first made in the sand with the points of the fingers held at certain distances, the thumb, fore, and little fingers being generally employed as the compasses. At first the eye is accustomed to judge of distances by the position of dots,—the next step is to connect these dots by straight lines,—then to draw straight lines regularly between the dots,—then to prolong these lines till they meet beyond the dots. Square forms are usually selected as being the easiest for a child to draw, and more attention is bestowed on educating and accustoming the eye to judge of distances than in drawing perfectly straight lines. At first plain squares are drawn preserving the dots; then various combinations of the square, vertically, horizontally, or diagonally arranged. This is, perhaps, the most impressive way of teaching the various uses and combinations of the square, and of educating the eye to judge of its relative size and value for filling given spaces, as it can be seen at a glance, and without much effort on the part of the child, which squares are large and which small. The multiplicity and variety of these patterns in which the square forms the basis are very instructive. This system of instruction has the advantage of explaining itself, without being perplexing or intricate, and of accustoming the child to draw lines in a bold, free way from the shoulder and not from the wrist, as in our systems of drawing. The patterns are usually drawn at first from 18 in. to 2 ft. in length, so that each square would vary from 2 in. to 4 in. After a facility of drawing them with single lines has been acquired, they are done on a larger scale with double lines with the fore and little fingers. Curved lines are then added to complete the border of the pattern. The square is looked upon by the Hindoos as the most important geometrical form, and the basis upon which the measurements of their designs and patterns are to be laid down. These illustrations may have a special interest, as they were drawn by the Hindoos themselves, and many of them had been in use in families from whom they were purchased as the ordinary patterns in daily use in Hindoo families. They hardly deserve the name of drawing lessons, as there is both a religious and a caste importance attached to them, for the different trades and occupations of the Hindoos are indicated by the patterns which are drawn in white on the road in front of the houses. In some families there are as many as 1,200 patterns in use, and it is occasionally the boast of the women who draw them, that they can go on for three years giving a new pattern every day. The name given to this kind of pattern in Southern India is Moghoo, and when girls are about to be married, one of the tests of her domestic education is the number of these patterns which she can draw. There

is some sense in this, for it is an index of the care that has been bestowed on her domestic education, and a proof to her neighbours that she has been taught to clean the house, and to say her morning prayers to her preserving or her destroying deity. Amongst the Buddhists and the Early Hindoos the square was supposed to be typical of the solidity of the earth; the triangle, of fire; the circle, of the sea or water; and the crescent, of air. To these the later Buddhists added a fifth element, or the winds, represented, in some instances, by a pyramid with turned-up points, as seen in many of the pagodas of Burmah and China, and in a few of India. But to return to the square and its uses as applicable to ornamental purposes. The Hindoo child is taught to examine and to reproduce for itself, and to attach some meaning to each; for instance, in several of these patterns we see a central square, with numerous others arranged about it in pleasing combinations, each square touching the next, but the idea of solidity or continuity destroyed, and an approach to decoration given by the mere arrangement of a few straight lines within squares. You will have no difficulty in detecting that the ideas for some of these patterns have been suggested by bamboo mats, others by grass mats, and a few by cloth weaving. After a facility of drawing in sand, square forms, and patterns of simple combinations of straight lines has been acquired, the child is taught to draw them on the cleanly-washed mud floor or on the stone steps at the door; but the style of drawing differs materially from the methods followed in Europe. A little chalk or chunam in fine powder is held in half a cocoanut-shell, and the points of the fingers are dipped into it. A succession of dots is laid down to mark the leading parts of the pattern, the lines of which are drawn by sprinkling the powdered chalk, and not by drawing with a point as we do. In this way a steady hand and a bold freedom of style are acquired, which are frequently carried to great perfection in after-life by both Hindoo men and women when designing patterns for weaving. In order to make the patterns more attractive to children, various simple but cheap and tasteful modes of combining colours with the drawing and geometry are had recourse to. One of the most common methods is to fill up the squares or spaces with coloured powders, and either to trim up the lines of junction with a split and pointed bamboo, or to pull some flowers to pieces, and to arrange the petals along the sides of the squares, so as to hide the inequalities; for this purpose the flowers of the white jessamine are most frequently selected; sometimes the yellow jessamine is used. The coloured powders used for filling up the spaces are natural ochres for the reds, yellows, browns, and purples, mixed with chunam to give brightness. When the following colours are used, — turmeric, king's yellow, orange and yellow, chromates of lead, or red lead,—the materials with which they are mixed are arrowroot or starch. When delicate blues or lakes are employed, the material with which they are mixed is kaolin or porcelain earth. The object of using these different substances with particular colours is to avoid the chemical action of the lime on some of the colours when applied to a wet floor. This shows a considerable knowledge of chemistry. It will also be remarked that the colours are at first used in their purity, and the chalk, kaolin, or starch is added to brighten the effect. In this simple but ingenious way great numbers of patterns are produced. The use of secondary colours, as green, purple, and orange, is taught by simply washing the floor after it has been coloured with the three primaries—red, blue, and yellow. The effects of the tertiary colours,—russet, in which the red predominates; olive, in which the blue; and citron, in which the yellow is in excess of the other two, are often very beautiful when these are interspersed with other colours. On looking over a number of these patterns, it will be remarked that blue is used very sparingly, and always of a very tender shade, and that its place is often supplied by a grey; that white and black are chiefly employed in thin lines or partitions between colours, and seldom as principal masses. It may not be out of place to remark that the effects produced by these colours, flowers and green leaves on the mud floor are far brighter than can be produced in an illustration. It is customary to wet the floor with rice water before sprinkling the colours. As yet the natives of India have seen very little of the fine arts beyond a few busts, and statues, and bronzes of our Indian celebrities, and these not always by our best artists. The works of Chantrey, Foley, and Weekes have riveted their attention; but there are others of our townsmen, as Brodie, Lawson, Clark Stanton, Webster, and the two Stephensons, who are rising, or have already risen, to eminence. Let us try to put some of the best works of these and such like artists before the Hindoos, and if we assist their own modellers and sculptors to produce similar works of their own countrymen, we shall be doing a service to India by helping them to throw aside some of their prejudices of caste, and their more degrading sculptural obscenities. Art in India was far grander and purer 2,000 years ago, or during the early Buddhist period, and there are sculptures still in fine preservation, from having been carved in granite, that show proofs of a careful study of chaste and simple nature. In order to make art telling in India, we must teach them to make it profitable, and if possible cheap, for there are but few patrons of real art in India. Some of the lectures on art industry which I delivered in Edinburgh last year touched the hearts and the sympathies of some of our townsmen. I trust that this year more may be inclined to come forward to help on the cause.

ARCHITECTURE AND LANDSCAPE.*

Buildings placed on the side or slope of a hill are susceptible of rather different treatment from those on a summit. There is not so much room for boldness, for the building is, as Dugald Dalgetty would have said, "slighted or overcrowded" by the hill, and in general a square low form seems the most suitable for hill-side architecture. This is especially the case where the hill forms a tolerably regular slope, in which case the form of a rather horizontal building forms a kind of break or parenthesis in the slope when viewed in profile. An instance is shown in the view of the summer-house of the Villa Madama, taken from Percier and Fontaine's "Maisons de Plaisance"; and in Turner's "View of Mailleraie," where the white house, terminating the long slope of the hill, is really the point of the picture. Irregular groups of buildings on a hill-side are nearly always pleasing, and are a favourite incident with Turner, as in his view of Greville, and in a very effective sketch in the "Liber Studiorum," which I have not unfortunately had time to copy. But single buildings in such a situation are generally best kept long and low in outline; and while a building on the summit of a hill seems to demand some sort of cupola or finish, by way of crowning the edifice, on the side of a hill this is lost and is not needed, as the building never suggests itself as a final point in the composition, but only as an incident *en passant*. An instance of a remarkably picturesque terminal building on a hill summit, varied in skyline and yet quite sufficiently solid and massive for the position, is given in the sketch, from a photograph of a palace at Cintra.

Buildings on a flat and undiversified plain present little for remark, as the architecture in such a case has it all its own way, so to say, and the only thing to be observed in relation to the nature of the site is to take care that the building has sufficiently elevated features to compensate for the low level of the site and the want of a position of vantage to see it from, and to enable it to be seen at a considerable distance. This is in regard to a wide plain out of the neighbourhood of mountains; but in a low site surrounded by hills the case is very different. A certain elevation is still necessary, but it is useless for the architect to think of competing with the mountains, though I know one or two cases where this has manifestly been attempted (in regard to massiveness of scale and general proportionate size I mean), and his best chance of a pleasing effect in such a site is to accept the humble position in which he finds himself in regard to nature, and to give to his building that appearance of simplicity and repose which will cause its position of retirement under the shadow of the protecting hill to appear perfectly natural and suitable. In the case, again, of a country neither absolutely flat nor bordered by hills, but varied by tolerably uniform and gentle undulations, a long horizontal treatment of building will be effective, as affording a kind of definite line for the eye to rest upon amid the wavy and uncertain contour of the landscape. This I think it is which gives a charm and a suitability to such a symmetrical horizontal building as the Villa Albani, backed as it is by an undulating country of no particularly marked character in one respect or another.

The combination of architecture with a wooded country seems a more complicated matter for consideration than the two previous conditions; partly perhaps because we are accustomed to associate with trees such a multitudinous idea both in regard to the number of species, and the endlessly varying lines and breaks of contour which they produce. Yet by one of the most respectable authorities on such subjects, the matter is condensed into a very few words. Repton, in his work on landscape gardening, says that from a landscape-gardener's point of view there are only two styles of architecture, the *horizontal* and the *perpendicular*, or Grecian and Gothic; unless, he adds, we may name a third under the head of the *fantastic*, or, as it may be called, the Chinese. The worthy gentleman means what we should now call "tea-garden" architecture, still preserved in many of our parks. His views about architecture, if we consider them in detail, are certainly old-fashioned, but there is plenty of good sense and good taste in Repton, and many of his suggestions are very well worth considering in the present day. Proceeding with his simplification theory, he classes trees also into two main divisions, the *round* and the *pointed*. As to the relation between these and the two styles of architecture, he is of opinion that "trees of a pointed or conic shape have a beautiful effect with Grecian architecture; though an association with the ideas of Italian painting, where we often see Grecian buildings blended with firs and cypresses, may also have some influence on the mind." There is no doubt that association of this kind does influence us very much in such matters; so much that it is not easy always to discriminate between the result of association and that of unbiased judgment. But I am inclined to think Repton's decision is a perfectly reasonable one, and that trees of a vertical tendency and of a tolerably symmetrical character of growth do blend well with a horizontal building. At all events, I think it quite clear that they do *not* go well with a vertical one; they confuse and weaken its effect. Repton's necessary conclusion is, of course, that Gothic buildings go with round forms of trees, because, he says, "they have a varied skyline, and hence are peculiarly suited to sites where the shape of the ground hides the lower part of the building, while its roofs are relieved by trees whose forms contrast with those of the Gothic outline." We do not in the present day (at least, I hope very few of us) go about, dropping a Grecian building on to the country here, and a Gothic one there, just as fancy and the nature of the site may determine; but in their essential meaning, these remarks, if true, are as true now as when they were written. Further on we find sentiments on the subject of combination of the house with landscape which are quite refreshing:—"When the lawns, the woods, and the water, and the general face of the surrounding country are on so extensive a scale, the only means of preserving the same characteristics is by extending the plan of the house also; and how can this be effected unless we adopt the Gothic style of architecture? In Grecian or modern buildings it has been considered an essential part of the plan to conceal all the subordinate appendages of the mansion. Gothic enables us to use these in extending the design." Now, though the dear old man's notion of Gothic would probably horrify most of us, yet there is excellent sense and true perception of architectural treatment in this. Repton illustrates this by the view of Bayham, which I have copied, where he points out how the size and extent of the buildings, which are formed round a large quadrangle, are clearly traceable through the contours of the foliage, and thus the idea of largeness and extent is conveyed which could never have been obtained had the house been combined into a single block, and the offices planted out of sight. Indeed, upon this system, formerly so universal, and still practised to a great extent, of planting the offices out of sight, Repton is sarcastic, saying that he has often been required to plant trees for this purpose, which, during the lifetime of the architect and the owner, never do conceal the offices, and which, in the lives of their successors, always have to be cut down, to give a free circulation of air to the buildings. One other remark is worth quoting, viz., that "no form of building, as a rule, looks so insignificant in a landscape, in proportion to its actual size, as a cube," a fact which I have had occasion to verify myself

* By Mr. H. H. Statham. See p. 986, *ante*.

in an instance I shall mention, and which is owing to that form presenting nothing to lead the eye in any one direction, of length, breadth, or height. He adds very pithily that symmetry may make an extensive building look "small; irregularity will make a small building look large." In referring to Repton, I have purposely avoided alluding to anything connected with landscape gardening, which is the main subject of his work, because my object in this paper was to speak of architecture only in its connexion with natural landscape in its widest sense. But I would advise those interested on the matter to look up Repton: allowing for the difference in the architectural insight and knowledge in his day, they will find a great deal that is both sensible and suggestive. He was the acknowledged authority in his own day; and one of the most amusing chapters in Jane Austen's best story, "Mansfield Park," describes a dinner-table discussion as to the beautifying of a mansion and grounds, in which "Mr. Repton" is frequently referred to as constituting the court of final appeal. The principles he advocates, and which in the main, I think, are correct, would lead, however, to the conclusion that Greek architecture cannot well be assimilated with rounded and irregular foliage forms; which I should scarcely adopt: indeed, though I fear I am about to draw upon myself the contempt of the majority of my audience, I must confess that I never see the open colonnades in Hyde Park gates, and the trees in the park through them, without being pleased with the effect; and here, I think, is again the condition of contrast of line; the symmetrical grace of the Greek "order" with the unsymmetrical grace of the living foliage. As a combination of another kind may be noted the effect of the large, heavy, dark forms of the yew-trees in the Hampton Court gardens, with the palace as a background, of which I made a sketch just as a kind of reminder. The trees might have a better architectural background (with all deference to Mr. Stevenson), but the general effect is the same, and may stand as an illustration of the combination of conical trees with a heavy mass of horizontal architecture; the cone form is not acute or strongly marked, to be sure, but the character of the foliage is spiky, not rounded. The question as to the character of trees which ally themselves best with a building, however, really depends very much on whether we consider it in regard to natural scenery or to the formation of an artificial garden effect. In the latter case the trees are planted in some more or less symmetrical relation to the building, and really become a portion of the architectural effect; and perhaps Hampton Court comes more under this category. The consideration of this is, however, as I observed, out of my present subject.

If we consider architecture in its relation to the sea and to sea-coast effect, there cannot be a shadow of a doubt to what form of expression in building the aim of the architect should be directed. In all our associations the sea is connected with ideas of power, grandeur, or of a desolating fury of the elements; and in many of the finest coast scenes the facts tally with the associations for a considerable part of the year at least. The whole expression of a building to face the sea should be one of stern power and solidity. It should have the air of being rooted and buttressed in the rock, beyond all fear of being shaken or threatened by the invasion of the winds and waves. To my thinking, the architect could hardly have a commission more calculated to stimulate his enthusiasm for the more poetical side of his profession than the command to place upon a site overlooking the open ocean a building which should be in keeping with such a position. All the grander and more monumental effects of architecture, which modern life seldom gives occasion for, and even scorns as involving useless expenditure, are here not only permissible to him, but are actually the required elements of success in his undertaking. He has a right, by the very conditions of the problem, to be liberal in the thickness and massiveness of his masonry, to discard all prettiness and trivial ornamentation, to reduce the area of his window openings, to give to his walls that broad expanse of solid stone which shall seem as impervious to all buffetings of the wind laden with the salt sea spray, as is the rock itself; he has to realise the fine line of the poet-laureate, where he likens one of his heroes to a tower:—

"That stood four-square to all the winds that blow."

The painters are emphatically with us on this point. Look at the style of building which Turner seeks for to heighten the effect of some wild coast scene, as in the one named from Pembroke Castle. Imagine, for a moment, the outlines of Eton College, which (though not much in the way of architecture, strictly judged), plays its part so pleasingly as an ingredient in that quiet evening river scene—imagine it transferred to the scene of Pembroke Castle. The impression is that it would be gone in a moment. It is vexatious to think that (partly owing, I suppose, to the nomadic or intermittent nature of sea-side populations), sea-side architecture in general is marked by so exactly the reverse of the characteristics I have endeavoured to describe—that sea-side houses are commonly the type of all that is sham and rickety—and that on a visit to any place renowned for its fine coast scenery, where there are not old remains, the certainty (almost) is that the only building we shall find there in keeping with the feeling of the scenery will be the lighthouse.

In inland sites, water is a most valuable assistant and adjunct to architecture, lighting it up and reflecting its features under new conditions of tone and shading; so much so that I have sometimes wondered that more frequent effort has not been made to bring artificial water into sufficiently close combination with building to produce a united effect as one composition. Of course, sanitary considerations come in here, which often interfere sadly with the picturesque. We cannot very well erect buildings in the middle of a stream; but how picturesque they might be when so treated, we may gather from the instance of Pfalz Castle, which I take from a small engraving in Mr. Seddon's "Rambles in the Rhine Provinces." River banks, however, are not, in any sense, unsatisfactory architectural sites (unless very low), and there is something very pleasing and suggestive in seeing the course of a river marked by the varied outlines of successive buildings on its banks. In the case of merely ornamental architecture, monuments, &c., a combination with water might very often be resorted to with great effect, as in the case of the monument in the centre of the circular water in Bushey Park, which is a trumpery thing in itself, but which, as I saw it the other day completely reflected in calm water, backed by the splendid rich autumn tints of the trees repeated in the reflection, contributed to an effect which was worth remembering.

No architectural object plays so important a part in landscape as a tower. In a flat country it is invaluable as an addition to the landscape, and is itself then in the most favourable situation for effect. But it is not ineffective in the neighbourhood of hills, provided they are not so near or on so large a scale as to dwarf it. Turner, in his "Salisbury," gives great effect to the spire by taking a view which causes it just to break the line of the hill behind, evidently with intention; and in his remarkably effective view of Harfleur, the great spire, white in the light, is rather aided in effect than otherwise by the sloping lines of the hills to the right. These, and other instances in Turner, would suggest that, under such conditions, a tower and spire should be so placed that, from the best point for a view of them, they should appear to overtop the hills, and break upon the sky. In speaking of towers, it may be noticed that Claude, in his architectural subjects, almost always places in some part of his picture a plain, heavy, round tower, as a kind of foil or contrast to his columnar or Renaissance architecture. Turner seeks for contrast in his tower subjects, but he seeks for it in light and shadow; and where he has two objects of this kind, of about the same size and importance, he almost always puts one of them in light and the other in shadow. The original sketch in the "Liber Studiorum" for the "Greenwich" picture in the National Gallery, is an instance of this, and the two spires in "Coventry." Since it became my fortune to live almost, I may say, under the towers of Westminster, I have been constantly struck with the beauty of this effect; these two towers, at either end of the Westminster Palace, seem to have all kinds of expressions as different lights fall on them; and you may step out and find the Victoria Tower clad in purple and fine gold, resplendent and glowing, while the Clock-tower wears an almost threatening aspect; turn a moment after, and, behold, the scene is changed, and the Clock-tower is all glitter, and its prouder neighbour has relapsed into gloom. If, then, the aspiring architect has the rare good fortune of having to erect anything large enough to have two towers, let him keep them sufficiently apart to afford room for this varied play of Heaven's light upon them, this constant poetry of architectural expression. I cannot quit this subject without remarking on the interest and charm of the various views of the Victoria Tower which you get in coming down the Thames, from Putney or Chelsea. It is worth while to go a little way up the river to watch the effect of this tower as you come down again, and the varied aspects and perspective positions which it assumes.

Few things in architectural effect are more striking than the use often made of towers in the Mediæval French châteaux, where the dwelling part of the château is placed on a high rock or plateau, and the tower seems to plant a foot on the ground below, as if as a sentinel. Any one who examined the French *Commission* drawings in the International Exhibition must have been struck with the prevalence of this arrangement, and its remarkable effect upon architectural expression, as well as on plan and construction. Turner was evidently taken with it, as his view of Château d'Amboise indicates. In such a case, too, the almost rocky sternness and bare aspect of the tower forms the connecting link between the dwelling and the landscape. In modern mansions there are gentler methods of effecting this desirable object. Sir Charles Barry attached great importance to this gradual connexion of the house with the landscape, by extending its base, so to speak. The description of the way in which this was effected at Trentham Hall, in Staffordshire, under great disadvantages, always pleased me very much. Canon Barry (in his Life of Sir Charles), says,—"The hall was surrounded by lawns and paddocks, reaching down to a lake. These were converted into a succession of gardens of regular design, stepping down by terraces from the house to the lake, and by balustrades, vases, statues, and flights of steps, so connected with the architecture of the house as to spread out its base, and give it the dignity and apparent height which its natural position forbade." A connexion with the landscape may be formed even by other buildings around the principal one, and repeating to some extent its lines. The view of the Villa Caprarola, from Percier and Fontaine's book, seems to me an instance of this. I call that a remarkably fine and homogeneous composition; and it is so partly owing to the repetition of the horizontal lines and square forms of the principal edifice by the succession of smaller buildings stepped down the rock, and without which the contrast between the remarkably square, symmetrical form of the villa, and the rough, rocky character of the site, would be somewhat too rough and abrupt a transition. The way that a building leaves the ground is not without effect on its expression; and this may be noticed in two extracts from Mr. Billings's book on the Baronial Antiquities of Scotland. Borthwick Castle is a notable instance of the effect that squareness and mass may produce in a barren district, and rising from broken ground; but Udny Castle, a building of much the same characteristics, rising from a smooth lawn with a background of trees, seems quite out of place,—a mere excrescence unfitted to the scene. As an example of the poetic effect to be derived from a rude old building treated in harmony with the landscape, I would instance a fine painting by Millet, called "The Old Stone House," in the Exhibition of the Society of French Artists in New Bond-street.

The part which buildings play in giving scale to the distance in a landscape is very important, and if the architect has any regard for the effect of his building on the scenery, he should endeavour to give it an outline and proportion which will harmonise with the scale of the landscape, and to place it so as to afford an opportunity for assisting perspective effect. An instance of the value of a building in regard to this latter point is seen in the study of Claude (sketch referred to), where the small building on the distant plain, evidently, from its outline, a building of the same class and size as that near the foreground, contributes largely towards increasing the scale and effect of the distance.

The question of colour and tone is important, too, in its effect in connexion with landscape. In the course of the expedition of this society into Northamptonshire, when I was a somewhat indolent member of the party, we visited a place called West Deeping, where there was a quiet old brown stone church, of not very remarkable interest. At all events, it did not tempt me into sketching, and I strolled round to look into the water rushing through the mill-dam, and in

so doing opened out a view of a brand new parsonage behind the old church, all red, black, and yellow brick, tuck pointed, and everything proper. I did not get over the shock for some time, and perhaps you will feel as unkindly towards the brick parsonage as I did, if I say that it first suggested this paper. This part of the subject, however, is far too extensive to go into at the close of a paper, but I think a general means of avoiding harsh and crude effects, is to aim at employing as much as possible the building materials of the district, because these are what form the basis of the tone of the landscape; and though any new building looks raw and crude at first in the landscape, it will, if built of a material indigenous to the district, very soon begin to assume a harmonising tone. Not, however, that I would by any means speak slightingly of brick as a picturesque material, but I confess to an absolute hatred of the buff or yellow brick. It harmonises with nothing; it is gaudy when new, and insipid and toneless when weatherworn. But a rich-toned not-too-bright red brick looks very well in combination, especially with a wooded country. I noticed an observation in Repton (if I may refer to him once more) that a large red house is not displeasing, though he seems to think a small one is. I was struck with this, having observed in the architectural room of the Academy the last two or three years a tendency towards large red houses; and one I remember very well, though I forget the architect, where the red tone was carried in an almost uniform tint over the roofs also, by means of tiles. The site was well wooded close up to the house, and the effect, as shown in the water-colour drawing, was exceedingly pleasing. As to small houses, most of us remember the red house at Northampton. There is something also to be said for white in a landscape, where grace rather than richness is the prevailing character. You will perhaps think I am naming rather a trivial instance, but in walking up St. James's Park on some recent autumn mornings, I have been much pleased by the effect of the long white front of Carlton-terrace glittering in the sunlight, and seen through a network of thinly-clad trees. It would be pleasanter to think it was marble, no doubt; but let compo. have a good word for once. This kind of combination of pure white building with a screen of trees was liked by Turner, who has given a fine instance of it in his imaginary scene, called "The Garden of Boccaccio," in the National Gallery.

There is one other point on which I should wish to raise a question, and that is in regard to a very prevalent and increasing disposition on the part of some of the ablest members of our profession, who again are imitated by their juniors, towards what can only be described as more or less a "rustic style" for large country-houses. Some of the compositions of this kind seen from time to time in exhibitions and in the illustrations of the architectural journals, are so picturesque in themselves, and are in the best instances set forth by such capital and artistically effective drawing, that the judgment is disarmed on looking at them. Yet it is open to serious question whether this is, after all, the thing. In the first place, it may be doubted whether the comparative refinement and culture of modern life, in regard to which there is now little real distinction between the country and the town, meets with the best architectural expression in a building which conveys the impression of being a group of cottages thrown together into a house, with a turret added as a leading feature. Then, in regard to the connexion of the house with the landscape, I used the word "picturesque" in regard to this style of house, and it is so, but it seems to aim at including all the picturesque within itself, and presenting, one might almost say, the aspect of landscape and house in one. The limited degree of attention I have had to give to the subject goes far to convince me that rustic buildings, except on a small scale, and under special circumstances, are not effective in rustic places. The house should distinguish itself from the landscape more, and seem intended only to imitate the irregularity of nature. It is an artificial thing, and should not lose a certain degree of artifice. On the whole I cannot but think that it is the architecture of movement that we want most in towns, to give relief and variety to our streets, and the architecture of repose in the country, where the movement and variety are supplied by Nature herself.

Finally, let me say that if the reflections here presented be thought somewhat vague or deficient in practical bearing on the work of our profession, still I venture to think the consideration of architecture from this point of view is not without its value, as lending us a larger view of the interest and value of the art in its connexion with nature, and also as counteracting a tendency just now to think a little too exclusively of detail. It was partly on this latter ground that I thought the subject specially worth a little attention just at present. Of late years there has been a great reaction in favour of artistic furniture of every description, and whereas the architect formerly had little or nothing to do with the interior decoration of a building, now, in not a few cases, he takes a certain pride, and his client also, in having everything designed in one style, and with relation to the main character of the house. This has led to a great deal more attention to ornamental design, and apparently to a kind of theory in some quarters that such is the real business of the architect. The result is that we sometimes find buildings in which all the internal fittings are admirable, but of which the external design, or what is in strict sense the architecture, is uninteresting or positively ugly. The more the architect has to do with the fittings of his building the better, generally speaking, both for the building and for himself. But do not let him forget the larger and more important part of his task. His carpets and chairs and wall-papers soon decay and are changed, and in any case affect only the comparatively few who live in and are entertained in the house. But the exterior, the architectural composition, is in sight of all; he has the whole landscape for the theatre of his art, and his building, if constructed with true monumental stability, is a permanent contribution to the features and expression of the country. Let him treat Nature with due reverence, and she will not be slow to second his efforts. She will adorn his work with her own rich tints, surround it with her living verdure, pour upon it the magic of her fleeting lights and shadows, and make it a portion of her own everlasting yet ever-changing pageantry.

THE BRITISH MUSEUM AND SOME THINGS WANTED.

In these days of universal education it is a matter of no small interest to ascertain, not only who are being educated, but also what, and where, and how sufficient, are the means provided for those who either are already educated, or are educating themselves. This is a point of immense importance, and is a little new, for it does not seem as yet to have attracted the notice of that important body the London School Board, or other educational body. A few words, therefore, on it, and especially to a point in it which immediately concerns not a few earnest and industrious students and workers in the "literary pasturage," as Carlyle has it, may perchance prove of some service.

It has been well and certainly most truthfully said, that very much of the intellectual strength of modern England is expended in its newspapers and periodicals, and "reviews"; and judging by the almost daily increase of them this must be true. Of their popularity and interest there can be no sort of doubt, and the good service they render in very many ways is equally sure and certain. Many and many hundreds and thousands of readers there are who would never hear, much less know of, the new books, and thoughts of the thinking world, but for the monthlies, and reviews, and quarterlies which tell of them, and what they portend, and so ably at times criticise. We cannot, therefore, do otherwise than feel intensely interested in them, and can but wonder at the difficulty some find in at times getting sight of them at all. How is this, in these days of printing and reading? This question leads us to many considerations; but, first of all, to the present position of that great national repository of books, great and small, the British Museum Library. We hope to do a little service by calling attention to it. It is *the* library emphatically, and the last resource always in seasons of literary doubt and perplexity. Of the vast utility, of this great national collection of books, there can be no doubt, but with all this there are deficiences and hindrances in it, and connected with it, which none but those who use it can well estimate. It is to call attention to these, and to suggest an addition and alteration here and there, that we now venture a word or two.

We would mention at starting that there is no special room in the reading department of the Museum for periodicals, and the quarterlies, and what may be termed the *current* literature. All complete books, and printed matter of all kinds first go into what may be termed the private apartments of the Museum; to that portion of the library, that is, wherein the public are not admitted. There they remain,—for such we believe is the rule,—for a certain time before they get into the regular library, and so to be asked for and obtained for the purposes of reference or reading in the usual way. It is difficult for those who do not use the Museum as a matter of necessity to estimate the inconvenience of this rigid rule. It is sometimes almost a matter of dire need to get sight of a quite new book or review, if only for a few minutes. The book is a costly one, and hard to come at, and in the Museum alone is it certain to be found, almost wet from the press; but it cannot be seen consequent on this *too* rigid rule. It is all the while lying, may be, with vast piles of others, uselessly "doing nought," there perchance to remain till well nigh the end of the year, when, with others, it is catalogued and bound, and then passes in the usual official way into the regular public library, and so into the possession of the readers, like the books of older date, and more familiar aspect. It is to this inconvenience and evil then that we would call attention in the first place, and suggest, if possible, a remedy. Might there not be a separate room—say the *old* Reading Room, in use before the new circular building was erected—put apart, and to be used expressly for quite *new* books, and numbers as soon as published, and for all periodicals, and magazines, and reviews, and books which come out in parts. These books, and monthly and weekly literature to be written for, and given out to readers, and returned by them in the usual way, so as to prevent this room being used as a mere place of pastime. It would be as a place for "reference" that we would devote this new room, and as a place wherein the current writing and thoughts of the immediate *present* might be come at at all times, and in a convenient way. We cannot but think that such new room in the British Museum would prove a great public boon, especially to many connected with the press, and supply a great want, and do an amount of good which it would be very difficult to over-estimate. We ask for it the attention of the powers that be, who can withhold or give so much.

We could say a good deal more on this fertile theme by going into details, and by pointing to specialities, but must forbear. We would, however, add, that for the "home" literature inquirers such an addition to the Museum would prove a boon hardly to be estimated. And even more so in respect of the "foreign" reviews, and current printing, so much greater as appears than our own, large as it is. Few at present can estimate what this would do, for mere figures and statistics convey but little to the mind in such matters. But the sight of the books, especially when fresh from the printing press, must needs prove impressive and convincing. We should then see what the ever-plodding and industrious German does, weekly, monthly, and quarterly, in the way of thinking, and writing, and printing. And the Frenchman, for we suppose he stands next. And then in their turn all the other European printing powers might be made visible almost as soon as they themselves can see the results of their magic labours. We may mention in passing, and it is well worth note, that some of the foreign typography and "registering," as it is technically termed, is right pleasant to look at. Some astronomical tables from St. Petersburg we lately saw were quite works of art, so neatly and artistically was all done. We need to mention only, for the subject might lead us far, the Oriental pamphlets and newspapers, and even monthlies, — from Constantinople, Calcutta, Bombay, and even much farther off than these. They too are remarkable in very many ways, and instructive to glance at when fresh from native hands,—doing their work so differently from our own way of work.

It would be really difficult to suggest anything connected with the National Library more useful and handy than this addition to it would be. It would at once place before those who could make good use of it a complete view and idea weekly and monthly, if not daily, of the mental or literary state of the world,—from London to Calcutta, and from New York to Yeddo. There are no present means of getting at this except by the most tortuous and out-of-the-way, nay, by almost *impossible*, roads and processes,—to say nothing of the expense of it, far as that is beyond all private means, however ample. It must be,

however, as we have said, and it is important to note this, through a *new* department in the Museum specially organised for the work. What is needed is, that the new thought and printing of the world come to us at once, without waiting till the "loose numbers" are completed, and bound up into volumes. We want to see the new numbers as they appear, and as soon as published. A "Review" three or six months' old has in a measure passed away; for the new number, wet from the press, is but too apt to totally hide it. We cannot but think that the present Museum Library would itself gain enormously by this division of its labours; and that the standard "Reference" Library might be immensely improved, and certainly enlarged, through the weight thus taken from it. The great distinction would be, that the old Library, as it now is, would embody past thoughts and past writings, while the "new room" would enshrine the last and newest thoughts, and the very latest writings and printing all the world over.

We are here treating of a speciality, and so must not wander far from our point, but there are so many little things admitting of "improvement" in and about the British Museum Library, to say nothing of the general Museum collection itself, that we hardly know where to leave off. It is only those who habitually make use of the Museum that can duly appreciate the shortcomings, and awkward hindrances, small in themselves may be, but not a little perplexing. We content ourselves with but one or two: a hint may be of service, and can do no harm. *Bookbinding* is surely an artistic trade, if ever there be one, and if the contents of a book be the one thing needful to look at, as no doubt it is, still these same contents have an added charm when bound together in a suitable and strong and artistic way. All things are improving, so we are on all hands perpetually assured, but bookbinding is certainly an exception. If any one curious in these matters will take up and look at attentively an old-fashioned and foggy papered tome, in dull red or green covered leather binding, with its gilt lines, and quaint devices, and with perchance a finely-drawn "coat of arms" of its former owner on the face of it, then will be known what bookbinding really does mean, in an *artistic* sense. It is positively dangerous sometimes to open wide a smartly-bound and quite new book, for it may be—sometimes it is so—that the leaves start, and betray not only their own weakness, but that of the incautious reader! Surely the binding in the national library ought to be *model work*, both artistically and mechanically? It is neither. And then, but once more, and to confine ourselves to books. Books without end! Those who may look with some interest on this slight notice of things literary will perhaps have wondered at the selection made of "books of reference" in the public reading-room of the British Museum. We can hardly imagine on what plan this has been done. It would be impossible to conceive a more useful and comforting surrounding than a good library of well-selected books of reference of original editions,—by the way, not cheap reprints. It is impossible to know and to remember everything, all at a moment's notice; but all difficulty vanishes when you are surrounded with dictionaries and helps to memory, considerately brought together, and judiciously arranged. We hardly dare to pursue the subject, for it is wonderful to think of how few there are of "world" books; but of these surely there ought to be a well-bound copy of each one within reach here in this great library, *e.g.* the best descriptive account of each separate country of the world, and its best history. Surely these would be more useful as "books of reference" than the multitude of forgotten back volumes of the older reviews? We might go on; but all will know what a good library of "reference" ought to be. We commend these stray thoughts to the notice of those who can take action on them, and can do so much practical good by taking a little thought to the subject matter of it. In the present great national library and in our proposed "additional" room there must be, indeed, ample opportunity; but it all requires a little thought.

We cannot, as we have said, afford space for details, but still a few may usefully be glanced at here and there. But a few months back an official notice was published of the number of *German* books and printed matter issued by the German press; and it was found that in the last year it was no less than three times the number of our own, enormous as that number is. A wonderful fact. These are certainly the golden days of printing and publishing, and it is almost a subject to be wondered at that no effort has been made to make this mass of reading, as it appears, visible and useful to the public. We cite this by way of striking instance: Germany printing, as it would appear, more largely than any other European nation. It would be curious to inquire as to what proportion of this is *reprint* and translation, and what portion original work. Göethe, the master spirit of the Germanic literature,—to adopt that comprehensive phrase, might well feel surprised could he but see the *number* of new books,—mental printings,—every year published.

And this leads to one other subject of no small attractiveness, artistic if there be one, and that is the purely national character of the illustrations, and engravings, and woodcuts, to be found in the foreign publications and books. They are different from our own in many ways, and are as instructive, as telling of diverse nationalities, as are the very languages themselves in which the books are written. It would indeed be a boon were these visible as they are published,—to be glanced at, and may be studied. It would be a constant reminder of the turning of the literary world, its perpetual progress, and every new aspect!

THE RAILWAY MILEAGE OF THE UNITED KINGDOM.

IN the general annual report on railways, which Captain Tyler has just laid before the Board of Trade, he gives the total length of railways at present open for passenger traffic in the United Kingdom. The entire length in England, Ireland, Scotland is 16,082 miles, of which 8,687 miles are laid with two or more lines, and 7,395 miles with single lines of rails. They are distributed as follows:—In England, 11,369 miles; in Scotland, 2,612 miles; in Ireland, 2,101 miles. Notwithstanding the large number of miles in operation, the report states that the railway system is far from complete, in regard either to mileage or to improvements on existing lines. As the traffic increases, new portions of line become necessary in certain localities for the conveyance of passenger or fast traffic, independently of goods or slow traffic. It is added that many districts are still without railways, and in want of branch lines, and that partially to supply these wants the aggregate length of railways authorised by Parliament during the years 1870, 1871, 1872, and 1873, and not yet constructed, alone amounts to more than 1,800 miles.

STOCKWELL GREEN.

NOTWITHSTANDING that the Metropolitan Board of Works have given notice of their intention to apply for an Act in the ensuing session of Parliament to enable them to obtain possession of Stockwell-green, in order that it may be secured to the inhabitants as an open space for recreative purposes, the preparations for building upon it are vigorously proceeding, nearly the whole of the trees, and a considerable portion of the turf, having been removed within the last week or two, and it is stated that building will actually be commenced almost immediately, and the probability therefore is that before the Metropolitan Board of Works can obtain their Act of Parliament several blocks of houses will have been erected, the owners of which will, of course, have to be compensated. The proceeding is causing great dissatisfaction amongst the residents in the neighbourhood, and is a source of much irritation. It is regarded as an attempt, more clever and ingenious than fair, to take advantage of the certainty of the Metropolitan Board obtaining powers compulsorily to purchase the Green in order to obtain compensation, at the expense of the ratepayers, for the buildings which will probably be erected before the Act comes into operation. Of course, those who have entered into building agreements with the freeholders have a perfect right to adopt the course which they are pursuing; and, viewing the matter as a mere business transaction, there is nothing to be said against it. With respect to the letter signed "J. C.," which appeared in the *Builder* of last week, we are informed that that portion of it which states that Mr. Honey has not offered to sell the land for 4,000*l.* to the Metropolitan Board of Works, is irreconcilable with the statement made by Mr. Honey's brother at the meeting held at the house of the former in Stockwell-road, on the 15th of October. On that occasion it was stated that the sum of 4,000*l.* had been paid for the Green, and Mr. William Honey, solicitor, is reported to have said at the meeting that his brother had no wish to make any profit out of the purchase. It is perhaps due to Mr. John Cobeldich, who appears to be connected with the purchase of the Green, that at the same meeting he openly advocated the site being built upon, remarking that the land was too small to be of any use as an open space.

THE RISING GENERATION IN NEW SOUTH WALES.

THE New South Wales Public School League for making primary education national, secular, compulsory, and free, have issued a manifesto, and not before it was necessary, for it is estimated that in this colony one-third of the children of school age are receiving no education. In due time these children will become citizens, and it is neither fair to them nor safe to the State to let them grow up in ignorance. The first and chief aim of the league is to make education universal by adopting a national and uniform system, that shall embrace all children of school age within the colony, and that shall be based on the common and equal rights of all members of the commonwealth.

What they call for, in brief, is this:—All children of a given age to be either receiving or in possession of a given minimum standard of literary knowledge,—the age and standard to be fixed by Parliament. This standard to include the course of instruction now in common use in public schools; denominational schools to cease to be certified or supported by the State. Parents and guardians neglecting to educate their children to be compelled to send them to public schools, if sufficiently available, to receive the minimum of instruction provided by the State. No fees to be charged for this minimum, and all subjects beyond that to be left for the decision of Parliament. The great aim of the League is to have every adult inhabitant of New South Wales able to read and write.

MESSRS. WARNER'S PUMPS AND WINDMILLS.

THE use of wind, though at one time general, has gradually been abandoned, and one of the most valuable force-producing agents is allowed to run to waste. Let us hope that a new era is about to commence, when the wind and our streams will be enlisted to do the work which has hitherto had to be accomplished at great cost by steam power. The patent annular sail windmills made by Messrs. John Warner & Sons, Cripplegate, offer the means to this end. The principle is at once simple and effective, whilst the power obtained may be utilised for any of the various purposes to which steam and water power are generally applied. A strong frame supports the annular sail, which fills the place of the ponderous arms with their complicated sails of the olden time. A great number of these machines are already in use, and, according to the testimonials received by the manufacturers, have given great satisfaction. Machines of this kind, indeed, might with great advantage be introduced into mining enterprise, and would be the means of effecting economy.

The same firm make a treble-barrel portable colliery force-pump, which has the advantages of being easily transported, taking up little room, and requiring no mechanical aid, a pony being all that is required for its working. The pony is attached to an arm which is fixed to the axle of an inverted crown-wheel, gearing into a horizontal pinion-wheel, on whose axle are three cranks, working into the pistons of the respective pumps. A constant stream is thus kept up, and an air-chamber, acting as a cushion, relieves the machinery and pipes from all unnecessary strain. These pumps are capable of forcing water up to a vertical height of 100 ft., besides sending it for a long distance in a horizontal direction. These machines are already in use at a great number of our larger collieries and iron-mines. The machines are manufactured by the old-established and well-known firm of Messrs. John Warner & Sons, of The Crescent, Cripplegate, London, and have acquired a high reputation for their simplicity, durability, and great adaptation for dip workings.

The catalogue of windmills manufactured by this firm contains the descriptions of a variety of machines, which are destined to play a great part in the future of many undertakings.

OLD WESTMINSTER.

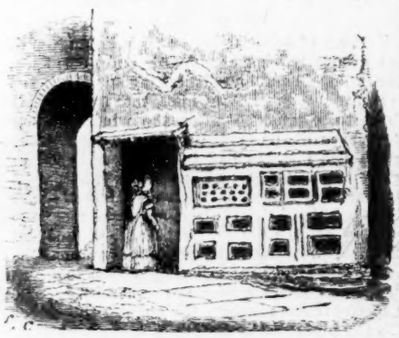
OLD ENTRANCE TO DEAN'S YARD, WESTMINSTER.

Few of our Metropolitan improvements have been attended with greater transformations than those effected in recent years near the Abbey Church of Westminster, and even the old inhabitant of the district, when passing into the north-west angle of Dean's-yard, finds his ingenuity somewhat taxed in attempting to identify the old with the present site.

Two short streets, a stone and marble mason's yard, several small, but neatly-built tenements, one public-house, a veterinary surgeon's and farrier's shop, coach-house and stabling, an archway, the never-failing cobbler's stall, and the old house under notice, originally occupied the ground on which the modern Mediæval block of buildings now stands.

Passing from the Broad Sanctuary to Dean's-yard, the time-worn mouldings of a broad arch, filled in with rubble and brick-work, indicated a remnant of the Gate House Prison. On the right was the mason's, then the tenements before mentioned, in which quiet lodgings for gentlemen were advertised by the small card in the window, and these, with the public-house, terminated the length of Flood-street. It was a retired and quiet nook, the silence of which was only broken by the clink on the anvil of the neighbouring forge, and the crar, crar, of the mason's saw.

Immediately before us, in the angle made by Flood-street and Little Dean-street, stood the quaint old house so well known to Westminsters as "Mother Beakley's."



It was a little square tower of timber, lath, and plaster, pierced with several lights of leaden casements, but the lower, or shop window, was a curiosity of stout cross-beam and upright framing, the superficial contents of which more than equalled that of the yellow time-stained and discoloured glass which filled the spaces.

Here the morning draught of milk was vended to the early scholar, for it was partly dairy, partly early breakfast-house, a place whence messages were taken, or to which they were brought, and parcels delivered. The descent to this primitive Temple of Diana was by several stone steps, for the pavement of the street was about level with the window-sill, and the paved kitchen presented a heterogeneous assemblage of caps, straps of books, hockey-sticks, rolls, cricket-balls, and milk-cans, the presiding genius over which attended to the minor domestic requirements of the Westminster boy.

Many a generation must have passed away during the existence of this relic, which had probably formed some portion of the eleemosynary buildings, and must have been a familiar object with the earliest scholars of the foundation. The primitive club-room must have been known to every boy that filled a place in Westminster School, from the days of Dr. Busby, to those of Dr. Goodenough.

But as great a change has taken place in the habits and manners of the boys as in the locality, and the regulations in connexion with them are now considerably improved.

OLD WESTMINSTER.

What Old Westminster boy but would remember the battles of the Scholars' Green?

In the old days there existed but a post and rail fence around it, and a short cut across it was frequently a temptation to the pedestrian; but woe to the trespasser if the boys were there. At that time, when the *noble* art of self-defence was fashionable, the Westminster boy was proud of displaying his prowess on any such occasion. There were no police then, and the population of the town could not have been one-half if a third of the present. A street-keeper or Bow-street officer generally contrived to keep out of the way, and so the fight went on uninterruptedly until satisfaction had been obtained.

On some such occasions an obstinate "coaly" has been known to exercise the active muscular powers of a King's scholar for an hour or more. If Greek met not Greek, he nevertheless objected neither to coaly, baker, dustman, sweep, nor other if trespasser, without further fear of the disgrace save that of being worsted in the encounter.

A considerable amount of Vandalism mingled itself with what then passed for manly independent spirit. Within a quarter of a mile of the spot there existed a cockpit, at which matches were fought at frequent intervals, and many a "green coat and tops," whilst betting on the barbarous sport of the time, would remember the locality in associations of his boyhood with his college experiences of the immediate neighbourhood.

In passing through the Dean's-yard toward the cloisters you seem shut away from the noise and bustle of the world, and the Scholars' playground, so frequently the scene of dispute, is surrounded by an iron railing. Latterly, in the summer of each year the specimens of the window gardening in the neighbourhood are exhibited. Prizes are awarded to the successful competitors in this humble but painstaking horticulture.

The old watchman's box under the College wall has disappeared, and his lanthorn long since been extinguished. The street-keeper has been supplanted by the helmeted policeman, in whose belted tunic we trace no resemblance to the square and long-tailed skirts and chimney-pot hat of his antecedent brother in 1832.

If many of our old relics have disappeared, much of coarseness and rudeness of manners has been swept away with them, and in the recollection of an "old site" and comparing it with the present we feel that there has been a slow but vast change in the habits, feelings, and manners of the population, and of which the railway system has been the pioneer; but, as in the human constitution, the too rapid or the too slow circulation will be found equally detrimental to health, we can only desire that the boon of progress may never disturb the good which lies at the bottom of many of our institutions, although much of the rubbish which has accumulated in and about them may with advantage be got rid of.

VAN DUN'S ALMSHOUSES.

Between Chapel-street and the narrow turning known as St. Ermin's Hill, in the Broadway, Westminster, the above charitable institution existed until but recently. Cornelius Van Dun was a soldier in the service of our King Henry VIII., and the almshouses were erected about the year 1577.

They retained much of their primitive character when sketched in 1862; but the alterations in the neighbourhood since the building of the St. James's Park Station of the Underground Railway have at length swept away every vestige of them.

Their site is now scarcely recognisable, midst the rubbish of partly-demolished buildings; but the charity, it is to be assumed, has been removed to another and more agreeable one for its recipients.

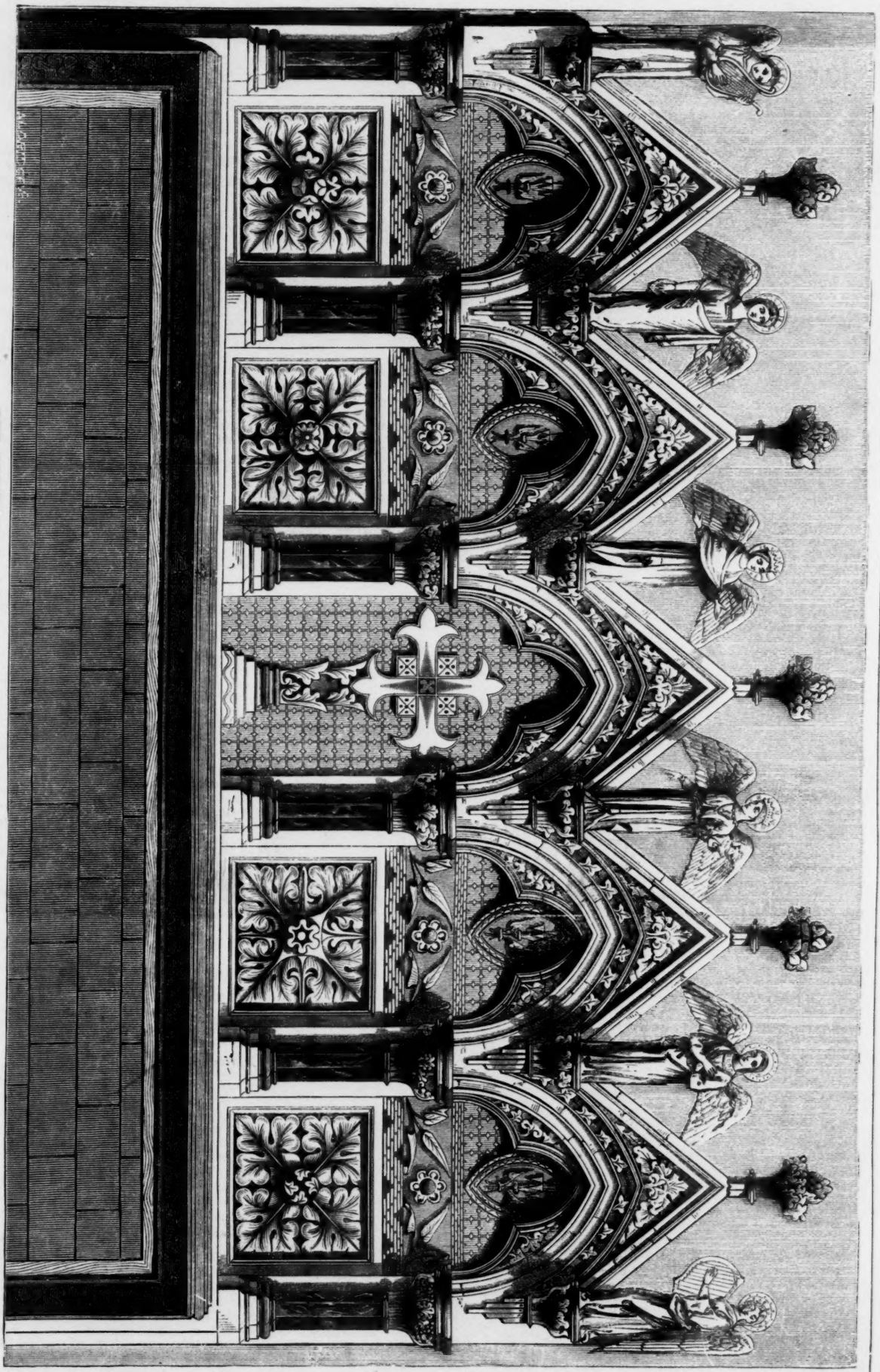
Stow, in his survey of London and Westminster, mentions them as standing upon "St. Hermit's" Hill; and in Rocque's map this hill is clearly marked as bordering on the fields. Even at the commencement of the last century this neighbourhood retained much of a rural or suburban character, sufficiently so for the church yard of the new chapel (now Christchurch) to be considered as the pleasantest about London and Westminster.

Van Dun's Almshouses.

Archbishop Laud was a liberal contributor to this chapel, built in 1631, and in its churchyard were interred Sir William Waller, of the Parliamentary army, who died in 1688. In this overcrowded burial-ground was a memorial of Margaret Batten, who was buried here in 1739. Her portrait is preserved in St. Margaret's Workhouse, in which she died (as asserted) at the advanced age of 136 years.

In this locality were situated the mansion and grounds of the Lords Dacre of the South, known as Stourton House. A portion of this site is to be recognised in the neighbouring thoroughfare of Stourton, or Strutton Ground.

In the adjoining manor of Tothill, held in the reign of Henry III. by the Chancellor Maunsell, we find a right royal feast given in 1256, when the king and a vast assemblage of courtiers and others were entertained under tents and pavilions. Some interest is awakened by the circumstance that the site on which these almshouses once stood was a spot sacred alike to the Briton, the Roman, and the Saxon. The "Thoth" of the Egyptian is identical with the Hermes or Mercury of the Greek and Roman, as also with the Tuisco or Teut of the Saxon; whence the main street or thoroughfare of the old town of Westminster derived its name. The hill of "Hermes" and the teut-hill of the Saxon are the same, and the name which Stow gives it, and by which it seems to have been known, is a curious coincidence, since the transition from "Hermes" to St. Hermit is not very difficult of



THE REREDOS, CARLISLE CATHEDRAL.—MR. STREET, R.A., ARCHITECT.

solution. The mound once sacred to this tutelary divinity of merchants and wayfarers, is now a heap of rubbish; the Caducæus and Petasus have taken refuge in the locomotive and telegraph hard by; but through the long vista of time perhaps this transition is not greater than the annual setting up of the May-pole on the neighbouring village green, or the wayside inn and cottages with their gardens yet in the remembrance of the octogenarian.

REREDOS, CARLISLE CATHEDRAL.

THE reredos erected in Carlisle Cathedral, and of which we give a view, was designed by Mr. Street, R.A., and executed by Mr. Thomas Earp, of Lambeth. The central portion, that behind the communion-table, is of alabaster, the columns are of Purbeck marble, and the panels are filled in with Venetian mosaics. The arcading at the sides, running north and south, is of yellow Mansfield stone; the cornice is of Purbeck marble, as are also the labels of the arches; the columns are of Rosso antique marble, and the panels between of rich inlaid marble work. There are also two screens of the same materials, filling up the spaces between the large columns on the north and south sides, that on the south having the sedilia and credence-table. The whole is now completed; and, in addition, the sanctuary floor is being laid with encaustic tiles and marble; there are also three new marble steps from the choir to the sanctuary floor.

EXCLUSION OR NON-EXCLUSION IN ARCHITECTURE.

IN the course of a presidential address to the Liverpool Architectural Society, at the opening of the new session, Mr. Joseph Boult, after naming the various journals which have been established in connexion with the profession of architecture, and describing the scope and present condition of the existing metropolitan and provincial architectural societies, said,—If we turn from this brief retrospect of comparatively recent efforts to consolidate floating units into a profession to the earlier history of architects and architecture, we shall find little trace of that compactness which distinguishes the learned professions of divinity and law. It is true that the term architect is used by Herodotus very much in the sense in which it is now employed, including the civil engineer also, and that mention is made of the Ionian Corporation of Architects; but little is absolutely known of the actual position of those elder brethren, of their training, and of the esteem in which they were held. If the thread of history be taken up at a later period the clue is still untrustworthy. But little is known of the society of Freemasons, and how far the architect among them was more than chief workman, as the term literally signifies. It is doubtful if, in many cases, the architect was not of the religious brethren for whom the edifice was constructed; and when he was secular, whether he was not one of the workmen, who was advanced to that position of "leading hand" in consequence of his superior ability in design or workmanship, after having worked with the chisel, and passed through most of the detailed labour by which architectural design is matured. Take, for example, the description given by Gervase of William of Sens, one of the well-known architects of Canterbury Cathedral. He was not only *vir admodum strenuus*, but *in ligno in lapide artifex subtillissimus*. In the present day it is not considered necessary for an architect to be a very cunning workman in wood and stone; yet it seems highly probable that not only William of Sens, but every other architect in those days, when not one of the regular clergy, was a skilled workman; and it is not impossible that William himself was both, at the time his unfortunate accident interrupted his work upon the cathedral.

Take, again, another period, that of the Renaissance, and who will say of any of the distinguished men who designed the monuments of that period that he was a trained architect? Neither Leonardo da Vinci nor Michelangelo in Italy, neither Wren nor Inigo Jones in this country, can be included in that category. And, later still, turn to Dance, of the London Mansion House; Chambers, of Somerset House; or Fowke, of Kensington; and where are to be found the credentials which authorised them to practise as architects?

The lesson which it appears to me is to be drawn from the hasty review I have presented is this—that the exclusivists are premature in their efforts to define strictly who is an architect; in trying to do so they may exclude some who would be most valuable. The first step, I apprehend, is to gather together all who are desirous of being architects, and are likely to conduct their practice creditably to themselves and to those who may be associated with them. In the present stage it seems to me very unreasonable to designate the persons cited as exceptional men; for the list may be indefinitely increased, and it will then be found that the exceptional men are the rule, and regular practitioners the exception. Besides, let it be asked, in what respect were those men exceptional? and if it be answered, in their great ability as architects, will the esteem for those not so exceptional be increased?

But it is fair to assume that hitherto architects have not formed a profession, at any rate, to borrow a legal phrase, within the memory of man, and that the task has yet to be accomplished. Should it be urged that the exceptional men have hitherto sufficed to meet the demand, the rejoinder will be found in the wretched deficiency of taste, propriety, and skill in building generally, and in the sentiment that the public ought not to be content with the service that they have had hitherto, which, as a whole, was bad, because only exceptionally good. That it is more to the public advantage to have all buildings in an architecture which is good up to a certain level, than to have a few above that level, and everything else fathoms deep below; and that so long as reliance is based upon the exceptional the rule must be bad.

But reasoning of this kind presupposes, on the part of the public, intelligence by which it can be appreciated, and I apprehend few will venture to assert that intelligence is general, much less universal. Now, in the present day, whenever any important change is desired in public opinion, or public action, it is found expedient to enlist as many as possible of the public to attend when the subject is discussed, or to read essays on the subject. If architects are to adopt a similar policy they must organise meetings, make those meetings attractive, and induce the public or those who lead the public to attend, so that they may be interested in architecture, and then have that interest matured into intelligent appreciation. To complain of the want of intelligence and to exclude from the opportunity for improvement those who are accused of being deficient, appears to me eminently unreasonable. In this aspect the various county and diocesan architectural societies are doing good service, though alloyed with a certain amount of pedantry and dilettanteism which is regrettable, but which, possibly, will disappear as the members become more familiar with architecture, and with all its practical relations. In all ages the priesthood and the clergy have been the best friends of architecture; and when they and the public get beyond the limits of amateurism, they will better realise the great responsibilities of an architect, and will be reluctant to interfere with the results of his special study. In all branches of knowledge it is usually found that the ill-informed are presumptuous in the little they have acquired, while the better-informed are content to rely on intelligent advice. The former are ever ready to patronise pretenders and quacks, while the latter are too wise to believe in the intuitive possession of knowledge and skill, which they know can only be acquired by laborious study and lengthened experience. The competent man has nothing to dread from the criticism of the well-informed; and so, as it appears to me, every architect worthy of the name should strive to make the public well-informed, in order that shallow pretension may not be encouraged to his disadvantage.

There are, indeed, those who appear to dread the diffusion of a knowledge of architecture, lest every man become as wise as themselves, and the number of untrained practitioners be indefinitely increased. But, in addition to the beneficial results which, as suggested above, may be expected to attend a more general architectural cultivation, the proper check upon the surreptitious assumption of an architect's standing is to give to the architect the protection of a stated examination and a diploma, and the public would participate in that protection, as they would have a guarantee that the possession of a diploma indicated a known minimum of training. It may be many years before the profession may obtain such a recognition from the Legislature; certainly they cannot expect it until they have acquired the influence which only union can give, and can prefer their claim potentially. A chartered Institute, that represents but a small fraction of the recognised architects of the kingdom, and local societies, which include only half of the known resident architects, cannot exercise much weight on either national or municipal councils. Yet there have been many occasions on which the influences of the profession might have been usefully employed if the profession had any influence; as it is, the Institute has been serviceable on occasions, and in Nottingham and in this town the local societies have also been useful, and possibly similar effect has been felt in other towns; but it is manifest that the influence of the whole must be greater than that of a part, and the more comprehensive the Institute or a local society may be the more will its influence be acknowledged.

In this aspect the co-operation of influential laymen is of great importance; but, then, they must be intelligent on architectural topics before they can be really efficient aids for architectural purposes. To reproach laymen with ignorance and apathy, and to withhold opportunities for acquiring information and interest, is a policy eminently unjust and suicidal.

As respects the co-operation of builders, it appears to me most desirable that their co-operation be secured. The tone sometimes assumed when this topic is discussed seems to me very shortsighted and not a little presumptuous. The same persons who are very happy to associate with those whose skill is applied to the execution of the more æsthetic parts of a design,—sculptors, artistic painters, and decorators,—appear to shrink from contact with those who undertake the more constructive features. Now, both classes are essential to all good architecture; and the constructors are the more essential, because, as now practised, there is much architecture on which the scope for the artistic classes is very restricted; whilst there cannot be any architecture without building.

The jealousy, to speak candidly, which is frequently manifested towards builders appears to me very unwise, besides being extremely undignified. There is, or ought to be, sufficient scope for both, with a clear line of demarcation; and also many occasions in which their harmonious co-operation is most desirable, if not essential.

I hope the architect does not exist who has not consulted with builders and with intelligent artizans, and benefited from both. Considering how much knowledge is required to form a perfect architect, it is almost impossible to conceive of any man who possesses a mind so cyclopædic as to have all the information ready upon all occasions. His practice must be confined to one line, and be also very limited, and the sooner the younger members of the profession rise above the shallow notion that it is derogatory to seek aid from those of more experience in any branch of construction, or art, the better for the best interests of their profession and themselves. Now, whilst I would be as jealous as any of the interference of non-professional persons in the regulation of professional practice, I deem it of great importance that men experienced in the various branches of construction should be induced to attend the society's meetings, and to contribute the results of their experience to the general fund; and I am convinced that the interchange of opinion and the comparison of various experience would be of service to all,—to the builder as well as to the architect. Who would not be delighted if Phidias were present to relate the growth of the Parthenon, the devices by which the blocks were conveyed from Pentelicus, inspired by his genius, and placed in the positions designed for them? And if his garrulity should run on over the polychromatic decorations, the preparation of the surface, the manufacture of the pigments, the combinations of colours,—whether these and other proportions were determined by experiments *in situ*, or predetermined in the study,—all those topics would be full of interest as of instruction, and every architect would delight to hear Phidias the tale unfold. Yet some of these are matters of construction; and, if the men were equally competent, I see not why those details should be more interesting from Phidias than from the ancient representative of the modern contractor.

But then there are builders who profess to be architects, or really have a trained architect in their establishment. This, doubtless, is a fact

not favourable to the friendly regard of other architects; but, then, why does the phenomenon exist, and what is the remedy? I apprehend it is due to the ignorance and apathy of the public, to which reference has been made already; and that architects generally would say that the combination is as undesirable as would be one between a physician and pharmaceutist; yet apothecaries have existed, and if not now to be found, the reason is in the greater enlightenment of the public, and in the efforts of both pharmaceutist and physician to prevent such a mulish monstrosity. If the combination in one person or firm of the architect and builder is bad, the evil can only be corrected as was that in the treatment of disease. At any rate, so long as so many of the public, including royalty itself, prefer the combination, architects and builders who object have no other resource than to work together until they are able to attain the result which has been gained by the physicians and pharmaceutists.

Let me remind you of one who is or has been a contractor for railways, and is also one of the most eminent authorities in architectural history: whose works, when he followed the profession, were esteemed as among the best results of patient research and artistic feeling, and who, since he has abandoned the practice of the profession for the more lucrative construction of important lines of intercommunication, continues to enrich its literature with learned and valued treatises on topics of great interest. The gentleman to whom I refer still holds an honourable positon among the Fellows of the Institute: and when he lends his ever acceptable presence at the critical examination of an ancient structure, or to the popular elucidation of architectural history, is welcomed with the respect and enthusiasm due to one who clothes learned erudition in unaffected language, through which the treasure he has laboriously acquired is rendered accessible to all.

No one would presume to question his right to retain an honourable position in the profession; but in conceding that it appears to me the principle of exclusion is shown to be fallacious when strictly interpreted. Thus the admission into a professional society of those who do not follow the profession, but are engaged in the practical development of designs, becomes merely a question of degree, to be determined upon the qualifications of the individual proposed, and not on his relations to a class. This being so, it is to be hoped that individual recommendations will be esteemed with all reasonable liberality.

OPEN SPACES AND BUILDING OPERATIONS AT THE EAST END.

Throughout the Parliamentary borough of Hackney, which includes the parishes of Bethnal-green and Shoreditch, building operations are somewhat rife; but the great majority are of a minor character. The battle for "open spaces" is being fought out well in Hackney in continuation of the Epping Forest victory. Hackney-common is safe from building speculations, and has lately been slightly improved by the Metropolitan Board of Works, by the construction of a few passable walks across it from different angles. The open space known as the Downs, which is another considerable common, is a subject of litigation now between the Lord of the Manor and the Metropolitan Board of Works. If arbitration does not settle the matter shortly, it is feared the issue must be tried by a tedious and expensive process. Already the Hackney-downs have been inclosed in part, and a fence erected; but pending the decision, the Metropolitan Board of Works have them under their surveillance. The third open space, popularly known as the "London-fields," which has long been a matter of reproach from its neglected state, is now being improved. Lately, some very indifferent trenches were dug for the purpose of draining this ground, which, according to the season, is either an arid common or a dismal swamp. Last week, after repeated expostulations on the part of the denizens of Hackney, the Metropolitan Board of Works set some teams to work in ploughing up the barren waste preparatory to laying the common down in grass, preserving, of course, the immemorial pathways across. The London-fields, some years since were stealthily encroached upon by speculative builders on the western side. On the eastern side, near to London-fields Railway Station, some well-built red brick family mansions still exist, erected in the eighteenth century when the common in front was really "fields," and afforded a pleasant look-out across the open country over Dalston and Kingsland, and extending to Islington, and farther due north and north-east. The long-retarded and urgently-called-for improvement of "London-fields" will be a boon to the inhabitants dwelling in the close streets and courts on either side of Hackney-road. It will be a blessing, too, if properly laid out and cultivated, to the sickly children who attend the new School Board School in the immediate vicinity, one of which schools faces the southern end of the "Fields." The focus of the ancient hamlet yclept "The Triangle" has undergone several changes in its appearance of late years. Old buildings have disappeared one by one, and shops have usurped the place of mansions built in the reign of Anne and the first George. West-street, which is used for a short cut *viâ* Goldsmith's-row to Hackney, is totally unable to afford a safe ingress or egress through the Triangle. One line of vehicles must wait while the other is passing, and in the effort to force a passage or to take advantage of each other, carmen and horses are often severely injured. West-street calls for immediate widening by demolishing the old house property on the northern side, which is not of much value. On the site of the old Mansion House, opposite the Triangle, whose demolition we noticed some months back, three houses with shops, of a better description than are usually erected in the district, are now in course of completion. Some of the features of the old mansion are retained in the architecture of these fronts, such as dividing and projecting brick pilasters and cornices on head, of same material. On the western side of the immemorial Triangle a public hall is being erected, to supply the wants of the neighbourhood, the Hackney Town-hall not being procurable, owing to certain restrictions in the lease for ordinary public meetings apart from the local body. A piece of land situated between the Bethnal-green Museum and St. John's Church, is now being turned into a small people's garden in connexion with the Museum. This is done at the instance of the authorities of the South Kensington Science and Art Department. There has been much delay over this small affair, and it seems to have been left as a legacy from the last Government to the present, who are certain to finish it. Judging from present appearances, the elongated strip of land taken from Victoria Park, and which led to much agitation upwards of two years ago, is now all built upon. The Park Preservation Society, established to preserve this and other spots, failed to secure this strip of land, owing to the hard terms of the late First Commissioner of Works. The houses erected on this strip of Park land are of the cheap speculative kind, and, as usual, the builders dug out the sand from the foundations, and from the road in front particularly, to a depth ranging from 12 ft. to 18 ft., filling up the excavated pits with all sorts of rubbish. Neither the Park land nor the public Heath has been preserved in this and other instances in the district. At Hackney Wick, upon those notorious "shoots" we described last year in our articles on "Homes in Homerton" and the vicinity, a new School Board school is being erected. The uncovered Hackney Brook, or open Marsh sewer, runs close by. A great depth has to be sunk here for a stable foundation for this school, considering that the filled-up soil, or rather scavenge, extends in places from 6 ft. to 9 ft. Under this it is veritable swamp, or the original marsh land. Surely a more suitable spot could have been found for the erection of a school. The wants of the locality demand the immediate erection of a school, or rather schools; but a spot at a higher altitude, we think, could have been secured, instead of picking out the lowest spot in the district. Several manufactories are crowded together here on the low ground, and the smell emitted by their waste substances, and the smoke of their chimneys, do not add to the salubrity of the neighbourhood. A portion of the open Marsh sewer alluded to a year ago has been covered over recently to the extent of about 300 yards, or perhaps more, and its continuation, which we stated to be an absolute necessity, is now determined upon. By covering in this foul sewer, and continuing it in an almost straight line to Lea Bridge (by diverting its old course), much land will be saved, and the health of the district improved.

At the North London Station, Amhurst-road, Hackney, a station-master's residence is about being built, and lower down in the same street the site is mapped out for branch premises for the London and County Bank.* Alongside the building a new thoroughfare will be opened, commencing with, and in continuation of Cold Harbour-lane, entering into Mare-street, near the head of Dalston-lane. As soon as a suitable site can be secured a new Presbyterian church will be erected in South Hackney or near to, for the wants of the congregation lately worshipping at Albion Hall, London-wall. The lease of the Albion has expired, and St. Thomas's Hall, South Hackney, is now being utilised for the temporary accommodation of the Presbyterian congregation. Some of the Shoreditch projected improvements we have already indicated, and we may speak of them in detail on a future occasion.

SCHOOL BUILDINGS AND FITTINGS.

In the paper on this subject already referred to, Mr. Roger Smith, after treating of the general arrangement of schools went on to say:—

The staircase most suited for children's use is one where the open space with which we are familiar by the name of well-hole is replaced by a brick wall. The steps ought not to be too long, as it is rather desirable not to induce children to go up or down more than two abreast. I believe a length of 4 ft. 6 in. to be ample, and 4 ft. or even 3 ft. 6 in. enough. The steps should not be high, not more than 6 in. rise. There ought not to be any "winders" (the name by which the steps triangular in plan which wind round at the turn of most staircases are called), and in their place there should be landings; lastly, the flights of steps should be short, and the whole ought to receive plenty of light and air. These precautions are taken to reduce to a minimum all chance of serious accident, and to promote the welfare of the children. In a school of any size it is not only desirable to have two staircases, one for boys and one for girls, but it is an excellent plan to arrange the steps so that two sets of stairs may occupy the space of each staircase, an arrangement which it is not often difficult to carry out. When this is done each class-room may open into the landing of a staircase if wished.

The tall buildings which require such staircases are no doubt proper in a large city, where land is very dear, where daylight is apt to be much interrupted near the ground, and where a rather purer stratum of air is to be met with in the upper stories of the building than is to be found below; but where there is sufficient space, free air, and ample light, one-storied buildings are best. The covered playground, formed under a lofty building by carrying it on piers and arches, is often less desirable and comfortable than a shed built for the purpose. It is more apt to be draughty, gloomy, and damp, and when it is adopted it should be carefully arranged, so that the sun may shine well into it for some considerable part of the day.

How to warm, light, and ventilate a large school-house is, perhaps, the next question which presents itself. The lighting, as has been already observed, should be as far as possible from the left hand, and the windows should be ample. An area of 1 ft. of window surface to 80 cubic feet of interior space in the room ought to be sufficient if the windows are well placed. For infant-schools a top light, and for drawing-classes a north light high up are required. The best aspect for a school is a subject that has been debated, some advocating a north aspect as securing the steadiest, purest light, and being free from the inconvenience of glare; others preferring a south aspect, notwithstanding the fact that occasionally during the summer blinds are needed, and inconvenience is felt from the sun's direct rays.

I believe there can be little question that the last is the soundest opinion, that sunshiny rooms are far more healthy and far more pleasant than those which the sun never reaches, and that, in a climate so cheerless as ours, this consideration ought to prevail over every other. The question of gas-lighting requires perhaps more attention than it often receives; good burners, plain strong fittings, and a place for the lights which will bring them tolerably near the children, and at the right positions for giving left-hand light, are the chief requisites.

The question of heating is, to a certain extent, mixed up with artificial ventilation, and both ought to be looked at together. During the summer months the windows afford what is now often called natural ventilation, and an un-

* How many bank buildings do the London and County Bank Company now possess?

sparing use of this suffices if the windows reach to the ceiling, and are capable of being freely opened without draughts, to keep the school and class-rooms fresh and sweet. The best form of window for this purpose I take to be that often known as a hospital-window, fitted with a series of casements, each of which is hinged at the bottom, and opens by its top falling back inwards towards the room. The external air is freely admitted by these windows, but its current is directed upwards towards the ceiling, and a very ample volume of air will enter without perceptible draught. It is quite possible to open and close casements so arranged by an apparatus which is simple and effectual, and which I have had made by Mr. Gibbons, of Wolverhampton, and have applied to two London Board Schools. This I name, because in some hospitals a very costly method of doing the same thing may be seen at work, and committees have, I believe, been deterred from using this, the best form of school-window, by the fear of being obliged to go to great expense in providing gearing by means of which to work the casements.

For many months in the year in England, it is not comfortable, or indeed safe, to carry on a school with open windows; and during part, perhaps we may say nearly the whole, of the same period, heating by some artificial means is necessary. This circumstance offers an inducement to make the motive power furnished by the heating arrangements, as far as we can, effect ventilation also.

In small schools, and in places where fuel is cheap, the open fire, which every one can understand, is on the whole the best means of warming, as it combines a powerful ventilating agency in its chimney, with direct radiated heat.

It is very desirable, however, to combine an inlet for fresh, warm air with the open fire in the grate. Many contrivances for doing this are in use, and it is only necessary here to say that they almost all proceed on the principle of utilising the otherwise waste heat radiated from the back and sides of an ordinary grate to warm a volume of fresh air which is poured into the room. Outlets and flues (adjoining the chimney smoke-flue if possible) should also be provided in order to carry off readily a portion of the vitiated air, and where these inlets and outlets are at all well proportioned to the size of the school or class-room to which they are connected, and are disposed with judgment, they will supply a very considerable and useful amount of constant, insensible ventilation.

In large schools it must be held to be the more economical and more scientific course to use a heating apparatus for the whole building. The cheapest apparatus, both as to original cost and probably also as to the amount of heat obtained from a definite consumption of fuel, will be hot-water pipes carried into the school-rooms and class-rooms, and exposed in the rooms. A large amount of heat is directly radiated from the heated iron surface, and a large amount is also distributed by the circulation of the air of the room, which becomes warmed by contact with the pipes, rises, and is replaced by another portion of cool air. But this circulation in no way assists ventilation; the pipes themselves are an obstacle, sometimes a dangerous one, to free circulation, and the radiated heat is often extreme; while if the system is such as to permit the surface of the pipes to be heated above a very moderate temperature (and this is the case in all systems which I have had an opportunity of examining where the pipes are of small bore, and the circulation is at high pressure), the air becomes desiccated (and I believe deozonised), and general discomfort ensues, such as militate seriously against the efficiency of the whole school.

My belief is, that a system in which the fresh external air is heated within a chamber in the basement by contact, not with a furnace, but with a mass of low-pressure cast-iron hot-water pipes, or flanged vessels, and is then conveyed through flues or channels to each room of the building, is the best system of warming for a large school; corresponding flues or other suitable outlets being provided for the outgoing current, for which, of course, provision must be made in the original construction of the building. It is not cheap; but if efficiently done, as it has been for me, by Messrs. Price, in one instance, and Mr. Boyd in another, it provides at one and the same time warmth and fresh air.

Such buildings as I have now described are the appropriate and convenient home for a school in which the three departments of infants, girls, and boys, are distnict, in which, in either boys' or girls' school, there are a head teacher, a certain number of certificated under-teachers, and a certain number of pupil-teachers. This, as I have already mentioned, is not the system in the most advanced schools on the continent of Europe. In Switzerland, Austria, and notably in Prussia, schools are arranged so that every class shall have its own class-room. The building contains class-rooms seating ordinarily about sixty each, connected together by suitable corridors and means of approach, and a large assembling-room, called the *aula* or hall, not usually large enough to receive all the pupils at one time, and not used as a schoolroom, in the sense in which we employ the term, at all. The whole forms a very compact, square block of buildings, admirable as a rule in every particular except its ventilation, which is generally defective.

It was desired, when the School Board for London commenced work, to try the experiment of building a school on this plan, and it eventually fell to my lot to design and carry out for the Board the school which they built on the class-room system, or as it is often called, the Prussian system, at Jonson-street, Stepney. This school, originally designed for 1,000 children, was subsequently replanned on a still larger scale, and as built affords accommodation for 1,675 children, of whom 575 are infants. With regard to the infants' school, which occupies the lowest floor, no special remark is necessary, except that it is divided into two equal and similar schools.

On the first and second floors occur the departments for boys and girls respectively. Each school possesses eight class-rooms, intended for sixty children each, and these rooms are grouped round a large hall, measuring 40 ft. by 75 ft., of which they occupy one side and the two ends. In this hall is an end gallery, and it is intended that both in the hall and on the gallery a class should be taught. The original cost of this building was extremely moderate, comparing it with the cost of many Board schools in London and elsewhere, not exceeding 7*l.* 12s. per child, and though it would not have been quite so economical if built for a much smaller number of children, still a school of the same general plan need never be a costly building.

This building varies to a certain extent from the Prussian model. The variations were partly due to the determination to obtain a very large hall, in which all the boys and girls could be assembled at one time, and partly to my desire to secure] through] ventilation. The ordinary Prussian school is a very solid compact block, and often has a central corridor, and so there is really no chance of ventilating the class-rooms completely. At Jonson-street I suppressed the corridor, making the class-rooms open directly into the hall, and I introduced windows at the sides of all such class-rooms as are corner rooms in the building. Elsewhere I introduced large windows in the wall, separating the class-room from the hal', treated the latter as a magazine of fresh air, and by this means secured the through ventilation of every class-room. In winter the warming by warm fresh air, accompanied by a system for the extraction of vitiated air, keeps the class-room sweet and airy.

I regret extremely that a second school of the same general character, but smaller in size, which it had been intended to erect, from Mr. Robson's designs, was abandoned. It would have been an interesting experiment and extremely likely to prove successful.*

This class of school, though the time has not yet fully come for it to be built in this country, is the elementary school of the future. It, or something very like it, is the middle-class school of the present day, or, to speak more correctly, the leading principle of it, *a class-room for every class, and a general room for assembly*, is the leading principle upon which middle-class schools are being designed, built, and conducted. I may refer to the Cowper-street Middle-class School, the magnificent new Merchant Taylors' School, and the schools proposed to be built by the Grocers' Company as examples of the class-room system. As time goes on there can be little doubt that elementary schools will conform to this model. Already, taking one of Lancaster's schools of seventy years ago as at one extreme of the scale, and a complete Prussian school as at the other, the planning of English school-buildings has advanced at least halfway. By slow degrees a greater and greater amount of isolation for the classes has been introduced.

First, came the breaking up of Lancaster's Macedonian phalanx into classes, and grouping them about a large room in full view of each other; next the placing those classes all on one side of the school-room, with curtains separating them; then came a single class-room; then two or three each to open solely out the school-room; and now one-half the school receives class-room accommodation, and the class-rooms are made so far independent of the school-room that the pupils taught in them have distinct means of entrance and exit.

These steps are all in one direction, and though at the present moment members of school boards may be unable to see their way further, there can be no manner of doubt that when next a change is made it will be made in the direction of more class-rooms; it seems, therefore, matter for some regret, that among the very many elementary schools now being erected in great Britain, so few should be adapted to the most advanced mode of education practised in Europe.

Of the fittings required by a school, the benches and desks are by far the most important, not only because they are wanted in large numbers, but because they directly influence the success or failure of instruction and discipline, and their size and arrangement dictate the dimensions and shape of the school-rooms and class-rooms. The desk is required to accommodate the book for reading, the slate for cyphering, the copy-book for writing, and perhaps the music-book for singing, and it must provide storage for books not in use; its height, slope, shape, and distance from the bench must be regulated accordingly. I will dismiss at once those hybrid contrivances in which the unfortunate desk is also required to form part of a tea-table, or to disappear altogether and become the back of a church-bench, believing that every such complication adds to the difficulty of making it efficiently perform its legitimate functions. The bench ought to be exactly at the right height for the pupil, both as regards its height from the floor, its height below the desk, and its distance from the front of the desk, and it ought to be of the right shape for easy sitting. The length of the desk and bench, and the spacing generally, are to be regulated by the desirability of gaining easy access to each child's work.

The other fittings of a school, while of course they require care, are not of the same vital importance as the benches and desks, and need not, I think, be dwelt upon here. Nor shall I attempt to do more than name, and that in the most cursory way, some of the miscellaneous matters of which the school architect ought not to lose sight. It is indispensable to a well-ordered school for it to have ample water supply and efficient drainage; proper lavatories; sufficient cloak-rooms and cap-rooms; adequate conveniences in a detached building, approached under cover, and of simple construction; a covered playground to each department; a supply of pure drinking-water for the children; a class-room so lighted as to suit a drawing-class; in some girls' schools a class-room of large size as a needlework-room; one or more teachers' rooms; accommodation for a resident care-taker, or sometimes a teacher's residence; storage for fuel (and sometimes a committee-room), ought all to be provided in every complete school. There should, if possible, be no corridors, and where they do occur they must be roomy, direct, and well lighted. A playground of due size is also necessary for each department, and there should be provision for lighting it on dark evenings if there be gas in the buildings. If possible, the entrance for boys should be in a different street from that for girls and infants; at any rate, it should be distinct.

Nothing which can get out of order should be introduced if it can possibly be avoided. Everything should be of the best and strongest, for it will have to stand rough usage. Nothing through which an accident can occur should be introduced; and if it is found that by mischance any place where a child can fall through, or fall over, or any dangerous spikes or open water-cisterns are within reach of an adventurous lad, they should be at once removed at any cost, or completely protected. Nothing by which a child can be hurt should be knowingly permitted, or if discovered allowed to remain; no dark corners or places where fresh air cannot come should on any account be tolerated; and no pains should be spared to make the smallest details of

* Illustrations of this school, as of many others, will be found in our volumes.—ED.

the building and of its furniture as appropriate as possible to the purposes of the school; and here let me [say the managers, the teachers, and the architect should work together. Many minor matters are best understood by those who have the practical working of a school, and if it were possible, as a new school-house approaches completion, to secure the principal teachers, and to give such finishing touches to the arrangements as would suit their methods of working, there can be no doubt that after-expense would often be saved, and increased satisfaction would be felt by the managers. Lastly, but by no means least, all these matters should be thought out in good time, and at sufficient leisure, so that they may be introduced into the original contract for the building, and the heavy additional cost which always attend modifications made during progress may be avoided.

It has been my especial desire to embrace this opportunity of advocating before an audience capable of forming a judgment upon them the claims of the class-room system. So many classes, so many rooms, is the rule in many schools in Scotland, and Scotland is ahead of England as to education. The same thing is the universal rule in Prussia, and Prussia also is ahead of England. It cannot be denied that, absent from the noise and the distractions of a large common school-room, the class can better concentrate its attention upon its work, and its teacher can better give his energies to what he has to do. It seems certain that the same teacher would do better work in a class-room than in a general school-room, not only from the fact of being undisturbed, but also from being more thrown upon his own responsibility. He has, in the general room, the head-master to fall back upon in any difficulty, but while shut up with his class in their own room, he has far more need of self-reliance and firmness, and will certainly be a better man. The system seems undoubtedly destined to reach elementary schools in time; but if it really be the best system, it appears a matter for regret that at the present moment, when schools are being established by hundreds, and millions are being laid out upon costly and permanent buildings, we should rest content with a compromise, and should not, some of us at least, boldly decide to adopt the very best method that we can in our school management, and should not construct our buildings in such a manner as to be capable of being worked on that method.

Mr. Lucraft, in the course of the discussion which followed, asked for some information as to the drawing-class room, and Mr. Smith has since forwarded the following:—

"The great essential for a drawing-class room, is that it should have ample north light. The windows should be high up in the room, their sills probably 5 ft. from the ground, and their heads as high as possible. A room of rather long proportions will be found convenient, and the more lofty it is the better will it be lighted. If it is very large it is best lighted from the sides, if moderate in size a light from one end will suffice. A central skylight will not be found quite satisfactory, but one running partly up the slope of the north side of the roof, if the class-room is on the top story, may be used. More floor space will be taken up by desks and stands for drawing, however compactly arranged, than is required by children in an ordinary school or class-room. Facing the light there should be a row of strong hooks high up, from which flat plaster casts or diagrams can hang, to draw from, and lower down two or three large brackets on which to stand a round cast, such as a bust. If geometrical drawing is taught, a continuous table, about 2 ft. 6 in. wide, should be fixed under the window-sills. A closet for keeping casts and easels, and a press for diagrams and drawing materials are desirable, and it is very useful to have one or two lavatory basins immediately adjoining the drawing-class room. The walls had better be tinted of a light neutral grey colour, and the ceiling whitened. The whole of the light on a drawing in this room should come in from one side, and no cross lights should be allowed."

Drainage of Tooting Cemetery. — The Wandsworth Board of Works have consented to co-operate with the Lambeth Burial Board in obtaining an efficient drainage system for Tooting Cemetery, by resolving to spend 600*l.* in the erection of a sewer along the road running past the entrance of the Cemetery, if Lambeth will contribute 500*l.* of the money.

PROJECTED PUBLIC WORKS—RAILWAYS, DOCKS, HARBOURS, PIERS, AND BUILDINGS.

PRIVATE BILLS IN PARLIAMENT.

According to the notices which have been given with respect to private Bills, and the plans which were deposited on Tuesday, November 30th, in compliance with the standing orders of Parliament, the total number of private Bills which will be submitted during next session, is 296, of which a large proportion are in respect of projects involving building and other constructive works of considerable magnitude. Several of the Bills are in respect of extensive local improvements, and the construction of public works and buildings in some of the large towns and centres, in various parts of the country, as well as within the metropolitan area, whilst the Bills in connexion with docks, harbours, and piers are unusually numerous. The applications for powers to construct new gas and water works will also be found to occupy a considerable time before the Parliamentary Committees. As compared with last year there is a falling off in the number of applications for railway projects, which need not excite surprise. But as regards the several undertakings before named, there is a sensible increase as compared with those submitted during the session of 1874, in proof of which it may be stated that whereas last year there were only 60 gas and water Bills, the number of Bills under this head to be investigated next session is 77, in addition to 12 applications to the Board of Trade for provisional orders, making 89 in all; whilst the number of Bills of a miscellaneous character is 96, against 80 Bills of the same nature submitted last year. Of the 115 railway Bills, 35 are applications for powers to construct entirely distinct lines by newly-incorporated companies. The Tramway Bills and Board of Trade applications are limited to 9, and are for powers to construct tramways in Salford, Manchester, Liverpool, Hull, Middlesbrough and Stockton, Bristol, Glasgow, and Belfast.

The Bills connected with projects within the metropolitan area are 41, out of the entire number of 296, and may be classified as follows:—12 in connexion with railways, 8 gas, and 20 in respect of undertakings of a miscellaneous nature. Of the Railway Bills, one is an application by the Metropolitan District Company to construct a railway in continuation of their line from Hammersmith, passing under the Broadway, to join the Kensington and Richmond branch of the London and South-Western Railway. The Bill also seeks for powers to purchase the piece of land on the Thames Embankment, abutting on the company's station at Westminster and St. Stephen's Club. The Hounslow and Metropolitan (new Company) seek for powers to construct a line from the Hammersmith Station of the District Company to Hounslow. The Aldgate and Bow line (rejected last year) is revived by two bodies of promoters. One Bill is for powers to construct a line from Aldgate to Bow, forming a junction there with the East London Railway. The other project, called the Eastern Metropolitan, is also for powers to construct a line from Aldgate to Bow, to join the North London line. The Midland Company promote a Bill seeking powers to construct a new branch at St. Pancras, called the St. Pancras Connecting Line, commencing by a junction with the company's coal-siding lines, and terminating in West-street, St. Pancras. The Bill also contains a clause giving the company powers to purchase a large number of houses in several streets in St. Pancras, between Phœnix-street and Euston-road, on the north and south, and Skinner-street and Brewer-street, on the east and west, for the purpose of erecting on the site new warehouses and other buildings. Another clause of the Bill is for powers to construct a new line at Brixton, to be called the Brixton Station Branch, commencing by a junction with the London, Chatham, and Dover Company's Metropolitan Extension line, near Canterbury-road, and terminating on a piece of vacant ground in Brixton, where the company propose to build a new station and warehouses. The Great Northern Company have a Bill applying for powers to purchase land on the east side of York-street and the north end of the Maiden-lane tunnel, for extension works at King's-cross. The London and North-Western Company apply for powers to purchase land in Bloomsbury, Holborn; also in Poplar, between Russell-street and the Thames, and adjoining land belonging to the East and West India Dock Company, for the purpose of constructing new works. The London, Chatham, and Dover Company apply for powers to purchase the South London and Crystal Palace Company's Railway. The London Central, Metropolitan and South-Western Junction, East London, and Metropolitan Companies apply for extension of time for the construction of works already authorised.

Of the eight bills with reference to the supply of gas in the metropolis, three are promoted jointly by the Corporation and the Metropolitan Board of Works, and were noticed in the *Builder* last week. In addition to these the Gas Light and Coke Company have a Bill seeking powers to purchase land for the erection of new works in the several districts of Kensington, Kensal-green, Woolwich, Ham, and Barking. The Commercial Gas Company apply for powers to construct new works for the manufacture of gas and chemicals. The Imperial Gas Company have a Bill for increase of capital and the construction of new works. The Phœnix Gas Company promote a Bill for amalgamation with all or any of the companies south of the Thames. There is also another Bill for amending the Metropolitan Gas Act of 1860. This Bill provides for regulating the mode of testing the illuminating power; and also for regulating the supply of gas and meters. The Bill further provides for dissolving the whole of the companies, and amalgamating them all into one company. It also contains a clause to enable the Metropolitan Board of Works, the Corporation of London, or other local authority, to purchase the whole of the rights and interests of the companies by the issue of perpetual annuities, yielding an income equal to the statutory dividend.

Amongst the Bills is one of a novel character with reference to the metropolitan water supply. This Bill provides for the transfer to Royal Commissioners of all the powers, property, liabilities, and duties of the several companies now supplying the metropolis with water. By this Bill the New River, East London, Southwark and Vauxhall, West Middlesex, Lambeth, Chelsea, Grand Junction, and Kent Companies are to be dissolved, and their affairs wound up, and the shareholders are to be paid by annuities, and the directors and officers to have compensation guaranteed, by the Government; and the Commission is in future to supply water to the inhabitants.

In addition to the above there is an unusually large number of projects in the metropolis involving the construction of highly-important works, and the outlay of a heavy amount of capital. The Corporation have a Bill for powers to still further enlarge the western extension now in progress, of the Metropolitan Meat and Poultry Market, by extending it at the south and west sides, and erecting a new fruit, vegetable, and flower market. It is proposed by the Bill to improve the present approaches by widening King-street on the north side, and also to make a new street to Charterhouse-street, and another new street from Charterhouse-street to the junction of Snow-hill and Farringdon-road. In making the new streets portions of the London, Chatham, and Dover Railway, now in open cutting, are to be covered in, and portions of the proposed new streets and approaches are also to be covered in. The proposed new buildings are to called the Central Markets, and when completed it is provided by the Bill that Farringdon Market shall be sold, and the site sold. The Corporation also have a Bill for new works at the Foreign Cattle Market, which has already been noticed in our columns. The Metropolitan Board of Works have three Bills. In one of them powers are sought, amongst other things, for making an approach to the Thames Embankment by widening and opening out Savoy-street. The Bill provides for widening Savoy-street by setting back the east side of the Chapel Royal and the east wall of a house in the Strand. The embankment is to be approached through the Duchy of Lancaster's wharf, and a bridge is proposed to be constructed over Savoy-street to connect the Duchy House with the buildings on the west side. The Board also promote a Bill for freeing the bridges across the Thames, and likewise another Bill for purchasing Stockwell-green. There is also a Bill giving powers to the Metropolitan Board and the St. George's, Hanover-square, Vestry to make a new street from Farm-street to Mount-street. Another Bill gives powers to the Metropolitan Board and the Vestry of St. Mary Abbott, Kensington, to widen Church-street on the north side, near Holland-street, and Silver-street, as far as High-street, Notting-hill. A Bill of

a very formidable character, under the title of the "City of London Land, Station, and Subways," is promoted by a body who propose to purchase a large quantity of valuable property in the neighbourhood of Walbrook, Queen Victoria-street, and Cannon-street, with powers to construct a subway, and make shafts or openings from the street surface to the level of the subway. The Bill provides for the erection, on the site of the land purchased, of shops, offices, and other buildings of a superior character, and underneath a portion of the site acquired to erect a railway station for the use of the companies using the present or future underground railways in the metropolis. A Bill is also promoted for enabling the Commissioners of Public Works and Buildings to acquire land and houses in the neighbourhood of Star-yard, New-square, Chancery-lane, Carey-street, and Lincoln's-inn, for the purpose of constructing new courts of justice, and other courts and offices for making better provision for the Supreme Court of Judicature, and its judges and officers. The president and fellows of Sion College have a Bill in which powers are sought enabling them to sell the present site of the college and almshouses, and to lay out the site for roads and squares, and to grant building leases; and also to obtain powers to acquire another site for the erection of a new college and almshouses. The Crystal Palace Company apply for powers to enable them to grant building leases on the company's lands, and also for powers to purchase the Aquarium and Wurtemburg Stuffed Animals Companies. There is also a Bill giving powers to a new company to purchase the Regent's Canal and Dock, and to make several improvements and extensions, by enlarging the Limehouse basins, constructing a river wall or embankment 600 yards long; a landing-stage, 100 yards long; and other riverside works at Limehouse; together with a railway to connect the canal with the Great Eastern Railway. The London and St. Katherine's Dock Company have an application for powers to construct a new dock in extension eastward of the Victoria dock, and also two new piers or jetties. A Bill is likewise promoted for the enlargement of the Southwark Borough Market, by purchasing Adelaide-place, and erecting new buildings on the site for additions to the market. The Pneumatic Despatch Company apply for powers to lay down tubes from the existing tubes in Drummond-street, opposite the Euston Station, to the St. Pancras Station. Also to lay down another tube from the existing tube in Holborn, opposite Broad-street, Bloomsbury, passing under Great and Little St. Andrew streets, Upper St. Martin's-lane, Cranbourne-street, Leicester-square, Coventry-street, and Piccadilly, terminating at a depôt to be constructed at the Regent's-circus. The Bill promoted by the St. Pancras Vestry, to acquire possession and control of the old churchyard, St. Pancras, has already been noticed in our columns.

Amongst the Bills promoted in the provinces there are several town improvement Bills, indicating that works on an extended scale are contemplated in many of the large towns. A Bill promoted by the Corporation of Bradford provides for the construction of several new streets, and the widening of others. In order to carry out a portion of these improvements powers are sought in the Bill to take down Christ Church, and build a new church on another site. The Bill further gives the Corporation powers to purchase about 150 acres of land for the construction of two public parks. The Barrow-in-Furness Corporation promote a Bill of a very comprehensive character, which provides for materially extending the area of the borough. The Bill contains stringent provisions with reference to the site, elevations, and mode of construction of houses and buildings, clauses being introduced with special reference to the height and dimensions of houses, the materials used in construction, the thickness of walls, and other particulars, together with provisions for drainage and general sanitary arrangements. Powers are also sought in the Bill for new water and gas works. A Southport Improvement Bill contains a clause providing for the extension of the area of the borough to the extent of 1,682 acres. A Cardiff Improvement Bill also contains provisions for the extension of the limits of the borough; the construction of new streets and bridges; the improvement of existing streets and bridges; the erection of new markets and slaughter-houses; the extension of the cemetery; and the purchase of a large plot of land for a park and recreation-ground. A Stockton Improvement Bill provides for the erection of a large new cattle-market, and a general market, for which powers are sought in the Bill to purchase six acres of land. The Bill further seeks powers to make a new cut in the river Tees, and to enclose land now forming a portion of the bed of the river, on which to construct a new dock, wharfs, and warehouses. An Improvement Bill promoted by the Manchester Corporation seeks for powers to widen a portion of Deansgate, and several other principal thoroughfares in the City. A similar Bill, promoted by the Corporation of the neighbouring borough of Salford, contains provisions for constructing thirteen new streets, and widening, and otherwise improving twenty other existing streets. The Bill also provides for the construction of a new bridge across the river Irwell. An Improvement Bill, promoted by the Corporation of York, contains a clause for the construction of a new bridge across the river, with new roads on each side of the river to the bridge. There is also an Improvement Bill promoted by the Bristol Corporation, in which power is sought to take down and remove the parish church of St. Werburgh, and to sell the site of the existing churchyard and the rectory-house, the Bill also providing for the purchase of another site for the erection of a new parish church and rectory-house.

Amongst the numerous Gas and Water Bills there is one providing for a great extension of the Wakefield Waterworks, including the construction of seven large new reservoirs. A similar Bill, promoted by the Corporation of Oldham, contains provisions for the construction of five new reservoirs and eight aqueducts. The Manchester Corporation have also a Bill authorising the construction of five large new reservoirs, and a similar number of aqueducts; whilst the Bradford Corporation are likewise seeking powers to increase their works by the construction of three enormous reservoirs, one of which is proposed to be 800 yards in length.

The Bills in connexion with docks, piers, and the improvement of harbours are 18 in number, some of them of great magnitude. Amongst the projects under this head, one of the heaviest of the proposed undertakings is the Wisbeach Dock and the improvement of the river Nene. A company to be incorporated under the Bill propose to make a cut or channel in the river Nene, 1,300 yards in length; also to construct a wet dock in the bed of the river 9½ acres in extent, together with a cut or lock from the river to the dock, and likewise to construct quays and landing-places, and to erect warehouses, sheds, wharfs, and other buildings. The Board of Trade also apply for a Bill for the extension of the Government pier, and for the construction of new piers and works at Dover. The Milford Dock Company promote a Bill, giving them powers to alter and enlarge the docks, as already authorised; also to construct a new lock, 500 ft. long, and 70 ft. wide, and a graving dock 700 ft. long, and 93 ft. wide; also to build a Custom-house near the docks.

A WONDERFUL OIL WELL.

THE operation of "striking oil" in the United States is being carried on almost daily in every promising locality, and new "wells" or springs are continually being opened. Amongst the new wells lately discovered in Pennsylvania is one which deserves notice on account of its extraordinary yield of oil. Near one of the mushroom towns which this new industry has created, called "Petrolia," is a celebrated well called "Parker's Well," which is now, however, put quite into the shade. Taking the road from Petrolia and Parker's Well, soon after leaving Central Point, the traveller observes the words, "No smoking permitted here," in conspicious places. After a ride of about two miles and a half the top of the hill is reached, where a loud roaring noise is distinctly heard, and eighty rods farther on brings us in sight of the well. A dense fog or mist envelopes the derrick, engine-house, and tanks, while fully 1,000 persons are to be seen there gazing on the wonder of Armstrong county. The derrick has conspicuously placed upon it, in large letters, "Boss Well" and "Creswell City." There are two 250-barrel tanks full of oil; also two 1,200-barrel tanks, one of which is full. Three dams, one below the other, catch the drippings; and the rivulet beyond, we are told, for ten miles of a circuitous route to Alleghany River, is covered with oil. There are two 2-in. pipes connected with the well, one of which is shut completely off, and out of the other flows a steady stream of oil wit immense force. There is no perceptible intermission in the flow, and as it rushes into one of the 1,200-barrel tanks the foam and spray envelope the whole surrounding atmosphere in a dense mist. A trustworthy gauger informs us that he had gauged the well three times since the stream was turned into the 1,200-barrel tank, and he found it doing 1,750 barrels, and he estimated the leakage to be at least fifty barrels per day. He further stated that, in his opinion, the well started off out of the two 2-in. pipes, at the rate of 2,500 barrels per day. He also claimed that, although this was most incredible, he believed that if the full stream were turned on now it would do at least 2,000 barrels. The well is said to be the largest ever struck in the lower region. A farmer since the discovery has offered to sell his adjoining farm of 100 acres for 100,000 dollars, which ten days previously, for farming purposes, would not have brought 1,000 dollars. The surveyors are at work laying out Creswell city. The Parker's Well stands about two miles and three-quarters east of Petrolia. The number of wells drilling on the belt east of the most easterly well in the neighbourhood is six; namely, two on the Snow Farm; one on the Steel Farm; the Gushford Well, 1,000 ft. deep; the Crawford Well, 300 ft. deep; and the Prentice Well, 1,450 ft. deep. The latter is half a mile due west of the Parker's Well.

IMPORTANT WORKS IN WALES.

SEVERAL public works of an important character are projected in Wales. Amongst the schemes for which notices have been given that application will be made to Parliament next session, we notice, first, the revival of the project for the construction of a railway up Snowdon. Notice has been given that an Act will be applied for in order to construct a railway up Snowdon, on the principle, it is stated, of the Rigi railway in Switzerland. It is pointed out that the contemplated line will commence near the Llanberis Railway Station, climbing up the hill until it terminates at the well-known spring called Fynnondwfr-oer—a distance of about 900 yards from the summit. Another important undertaking is the construction of a new bridge over the Conway. Notices have been issued for power to incorporate a company to make and maintain a bridge over the river Conway at Talycafn, midway between Llanwrst and Conway. At the present time there is no bridge between these two towns, which are ten miles apart; and it is considered that the proposed new bridge has become imperatively necessary. The Barmouth Local Board also contemplate a number of improvements. In accordance with the terms of their Bill, they desire powers for the construction of waterworks, and the supply of water for the utilisation of sewage, compulsory purchase of land and other property, markets, &c., together with an extension of the local Board district. The Cambrian Railway Company are desirous of powers for the extension of their line from its present terminus at Pwllheli to Porthddinlleyn Harbour, and also the construction of a pier, fifty yards long, in the harbour. With regard to the new communication with Leland, which would thus be furnished, it is pointed out that Porthddinlleyn is a not unlikely rival to Holyhead in the competition for the Irish trade. The London and North-Western Railway Company do not seem to have many projects of importance in North Wales, although it may be mentioned that they intend to take certain lands, houses, and buildings in Holyhead for the purpose of making new roads in lieu of the present ones, adjoining their passenger-station. Improvements are further projected in regard to the drainage of the Flintshire mines. The Bill relating to the matter sets forth that powers are desired to construct certain drainage works for a number of mines and mineral lands in Flintshire. These powers comprise the formation of a number of tunnels or levels in the township of Caerfallisch: one 1,210 yards long, another 450 yards, and a third 1,210 yards. The promoters also ask for powers to levy tolls, &c., in the district benefited by the drainage works. With regard to improvements in Rhyl, it may be noticed that plans are now prepared by the London and North-Western Railway Company for the erection of a splendid new station at Rhyl, and it is expected that the work will shortly be commenced. Rhyl is also to have a new town-hall, and the laying of the corner-stone is fixed to take place on December 8th,

which will be celebrated by public rejoicings. Some complaints have been made in the town that this work has been commenced before the plans were agreed to and signed by the surveyor; but, be that as it may, the old hall is being fast pulled down.

IMPROVEMENTS AT DOUGLAS.

An extensive scheme for the improvement of the town of Douglas, in the Isle of Man, is now being carried into execution. Its principal feature is an embankment on the shore, entirely closing in the town, which may be described at present as having its back to the sea. This embankment will commence at the end of the pier recently built by Sir John Coode, C.E., and terminate at a point contiguous to the present Parade and Marine House. It forms, in fact, a continuation of the present road, which partly skirts the Bay of Douglas, called Castle Mona-road and the Promenade, and conjointly will afford an uninterrupted marine promenade several miles in length. In width, the new part will be only a few feet less than that of the Thames Embankment. It is to bear the name of "Loch Parade," given to it by its designer, in honour of the Governor of the Isle of Man, under whose auspices all its recent important improvements in the island have been made.

The other portion of the work consists of a new street, twenty yards wide, to be called Victoria-street. It will start at the end of Loch Parade, near the Queen Victoria Pier, intersect the embankment at its widest part, then run through the heart of the town, to the foot of Prospect Hill, which is the main artery of Douglas.

The entire improvements are being carried out from the plans of Mr. C. O. Ellison, of Liverpool, the architect to the Local Improvement Board. The marine portion is being executed under the superintendence of Mr. W. Powell, C.E., the resident engineer of the harbour works.

The sea-wall is being built of concrete, varying in thickness from 4 ft. to 8 ft., the face ramped, and finished on the top with a bold curved nosing to throw off the sea. The joints between the blocks are formed with deep sinkings, giving a massive appearance, but the irregularity of the courses somewhat detract from an otherwise noble work. One set of steps on to the shore is now being provided for, and others are to follow, the end being finished with a broad slope or jetty, which will enable vehicles to pass on to the shore.

The formation of the embankment reclaims a large quantity of valuable land, which it is intended to lay out for the erection of terraces of marine residences, hotels, &c. The land and sea views are, it may be mentioned, very fine, and the temperature in winter is said to be equal to that of the South of France. Victoria-street will be principally a business thoroughfare, and consist of modern shops with houses over them. It crosses the leading thoroughfare as at present existing, and gives access to every part of the town.

One part of the reclaimed land is set apart for an aquarium and baths, and a culvert is already built under the promenade for the supply of the sea-water, which is so pure that no filtration tanks will be constructed. The well-known fisheries of the island are expected to afford a constant supply of marine curiosities. It is also intended to erect a theatre on some part of the embankment, and doubtless other public buildings will follow.

The whole outlay of this scheme will not be much under 40,000*l.*, but so great is the quantity and value of the reclaimed land, and the estimated increased value of other property arising from the improvements, that the actual cost to the town will not be likely to reach a quarter of that sum.

THE NEW PUBLIC OFFICES AT GREENWICH.

The Greenwich District Board of Works are in negotiation for the purchase, from the trustees of the Bluecoat Girls' School, of the building in Greenwich-road known as Denmark House, and the adjoining land eastward,—as a site for the new Board-room and offices, which they have determined to erect. The whole property has a frontage of 82 ft., with an average depth of 105 ft., for which 1,500*l.* have been offered by the Board, or at the rate of about 3s. 6d. per foot.

SCARTH MEMORIAL HALL AT STAINDROP.

Last month, at Staindrop, near Raby Castle, the chief seat of the Duke of Cleveland, was laid, by Mr. J. W. Pease, M.P., the foundation-stone of a public hall for the town, which, in honour of the late Mr. J. F. Scarth, head agent for the duke, is to be called the Scarth Memorial Hall. The Scarths have for many years acted in the important and responsible capacity of agents to the Duke of Cleveland, and the present agent is Mr. W. T. Scarth, the son of the gentleman in perpetuation of whose memory the inhabitants of Staindrop, assisted by residents and the tenantry of his Grace in the district, have now inaugurated a good social and intellectual work. On the death of Mr. Scarth, in 1872, it was determined to enter upon a scheme of supplying the town with a public building in which meetings, concerts, &c., could be held, and where also there could be provided a reading-room, library, and other attractions, and it was felt that Mr. Scarth's name might well be handed down to posterity in connexion with the work. It was decided that the hall should bear his name, and forthwith steps were taken towards bringing it to a head. Most of the money needed was obtained from subscriptions given by people in the district, and a portion by means of a bazaar, &c. Mr. Scarth had always evinced a warm interest in any movement which concerned the educational and moral advancement of Staindrop and the neighbourhood, and it was generally felt to be a wise and happy idea that of combining in a testimonial to his worth an enterprise which would be a great social and intellectual boon. Mr. J. W. Pease, one of the members for South Durham, was, with his brothers, one of the earliest subscribers to the fund. Of others who have contributed to the scheme may be mentioned Mr. Morgan Vane, Mr. Dodds, M.P., and Mr. E. Backhouse, M.P. The estimated cost of the building is between 1,300*l.* and 1,400*l.*, which has been provided within 200*l.* of the sum, and with 150*l.* or 200*l.* in addition, the necessary furnishings and fittings will be completed.

Messrs. Ross & Lamb, of Darlington, are the architects who have been consulted, and who will superintend the erection of the new hall. The style adopted will be the French Renaissance. The building will be of stone, and will have some pretensions to ornamentation. The large room—for meetings, lectures, concerts, &c.—will be 57 ft. by 32 ft., and 23 ft. high; it will have a gallery and platform, and will accommodate 400 people. Behind will be what is called the Club-room, and available for other purposes; the dimensions being 25 ft. by 12½ ft., and 11¾ ft. high. Over this is a reading-room of the same dimensions. The contracts are expected to be fulfilled, and the building ready for opening, in August next.

THE LAW OF EMPLOYER AND EMPLOYED.

Mr. Rupert Kettle, the judge of the Wolverhampton County Court, and who is also a member of the Lord Chancellor's Committee in Bankruptcy, has just given his legal opinion as to the implied conditions of hiring and service.

1. As to the mutual obligation to work and find work? The employer cannot, by reason of his trade, be relieved of his responsibility to employ the day-man, or, in the alternative, to pay him his day's wages; or, to the piece workman, of the responsibility to pay him what would be the reasonable result of his day's work. He has entered into an obligation to find full employment, and this is one of the employer's ordinary trade risks. The law imposes it upon the master, who cannot relieve himself of it, except by terminating the contract of service by giving the notice customary in the trade.

2. As to the short supply of materials? I have before held,—and although differences from my opinion have been strongly and publicly expressed, yet I reiterate,—that providing materials is another trade risk to be incurred by the employer. I now say, as a lawyer, that it would be no answer to the averment of a breach of contract by not finding employment, that the employer could not economically provide the necessary raw materials for his servant to bestow his labour upon. The contract of hiring and service, like all other contracts under the English law, must be submitted to a reasonable interpretation. The workman is not bound to do or suffer for not doing an impossibility,—he is not bound to work if he is sick or disabled.

The master, on the other hand, is not bound to employ, if by any accident beyond his own control he is prevented so employing. He is not responsible for loss of time resulting from breakages of machinery, or occasioned by the illness of workmen whose labour must precede that of others. But the employer must use due diligence in employing proper machinery and proper fellow servants.

The employer will be no more relieved in law from compensating a workman for loss occasioned by selecting or continuing to employ an inefficient or an untrustworthy man than he would be in selecting an ill-constructed, unsound, or untrustworthy machine. He has no more right to subject his workmen to loss by knowingly continuing to employ a drunken foreman or engineman than he has by knowingly continuing to work unsound machinery.

THE COMMISSION SYSTEM.

ROBSON *v.* RUTTER.

The plaintiff in this action, at the Durham County Court, before Mr. E. J. Meynell, judge, is an agent for a Sunderland building society, and the defendant is a contractor and builder, of Brandon.

The sum sued for was 11*l.* 6s. for commission, alleged to be due for introducing the defendant to building work.

The plaintiff stated that a number of workmen and others had built houses at Brandon by obtaining advances of funds from a building society of which he was an agent. The defendant, Mr. Rutter, contracted for the erection of several of the houses, and it was arranged between Mr. Rutter and himself that he (witness) was to have a commission of 3*l.* for each house he got him to build. He took three men to defendant's offices, and they gave Mr. Rutter the contract to erect their houses, and he also promised to pay witness 2*l.* for any other house he got him to build. Witness then got him five more houses to build. Defendant then paid him 10*l.* on account, leaving a balance of 9*l.* due.

In cross-examination the plaintiff said he had been two years agent to the building society, and all that he had to do was to forward the money he received and not to find customers. The three men got advances through witness of 181*l.* each. He got a commission for collecting the subscriptions, but had never received anything from the three men named, but they asked him to find them a contractor, and on account of the promised commission he recommended the defendant.

Evidence was addued of the defendant's offer and promise to pay the commission.

The defendant said the plaintiff called at his office, and asked him to build certain houses, and to send in a tender, and he did so. The plaintiff said,—"As there are certain builders below you, if you keep the thing any way near, I will get you the contract, providing you give me a commission." He replied that he had no objection to give him 2*l.* a house; and when he got the first payment from the society he gave the plaintiff 3*l.* With regard to four of the houses, the contract was made with the parties themselves, and it was not in consequence of any recommendation of the plaintiff that the parties came to witness.

The plaintiff, on being recalled, said he never let the houses to the lowest tender. Another builder's list was lower than Mr. Rutter's. He did not think that Mr. Rutter had added the commission to his contract price. The defendant afterwards said he had been wrong in his tender, in consequence of the rise in the price of bricks.

The Judge gave a verdict for 2*l.* per house, with costs.

MASTER AND SERVANT ACT.

John Jones, a scoop-drawer and stoker, in the employ of the Phœnix Gas Company, Southwark, was summoned before Mr. Benson, under the Master and Servant Act, for leaving his employ without giving the usual week's notice.

Mr. Hale, on behalf of the company, called George Todey, foreman at the works, Bankside, who said that on the 27th of June last he engaged the defendant as "scoop-drawer," at the weekly stipend of 38s. 9d., paid every Friday evening. At the time he was told that a week's notice was required on both sides, and printed notices are posted up in the office and lobbies. He worked up to the 13th inst., when he was paid his week's wages. He, however, did not return.

In answer to Mr. Benson, witness said he did not give any notice of his leaving, although he well knew that it was required. The defendant had complained to him about the new scoop, which weighed about 70 lb., and contained about 1 cwt. of coal. He was exposed to a great heat, and was paid accordingly.

Mr. James Francis Broadwood, assistant engineer of the gasworks, said that the defendant was quite able to work the scoop, as it was much more easy than the old one. In consequence of his leaving without notice it had put him to considerable inconvenience, but they only put the loss down at 20s.

Mr. Benson convicted the defendant, and ordered him to pay 20s. and 2s. costs.

THE NEW BANK AND POST OFFICE, ASPATRIA, NEAR CARLISLE.

THIS block of buildings, now in course of erection by the Cumberland Union Banking Company, and intending to serve the purposes of a Bank and Post-office combined, is now rapidly approaching completion, and will form a striking architectural ornament to the town. They are built principally of the red sandstone of the neighbourhood, relieved with dressed stone of a greyish white from Shawk quarries. They were designed by Mr. D. Birkett, of Carlisle. The buildings comprise three distinct sets of business premises, the westernmost being fitted up as a combined establishment in which the duties of Mr. Forester's original occupation will be carried forward, the centre will be devoted to the rapidly extending business of the Aspatria branch of the banking firm, the east end being assigned to the accommodation of the post-office and telegraph departments, which have also shown a marked development during the last two years. The plans of the architect have been well developed by the builders, the contractors being for the masonry department, Mr. Henry Grave, of Aspatria; for the carpentry, Messrs. Rawlings & Hewitson, of Aspatria; plasterers' work, Mr. Ormerod, of Carlisle; painters and plumbers' work, Mr. George Goodall, Aspatria.

COTTAGE HOSPITAL, ENFIELD.

THE foundation-stone of the new Cottage Hospital was laid on Saturday last by Mrs. James Whatman Bosanquet, of Claysmore, Enfield. The building is of one story, and provides for men's and women's wards, four beds in each, one extra small ward, one bed-operating room, nurse's room, kitchen, scullery, bath and store rooms, and W.C.s. The architect is Mr. T. J. Hill, of the City-road, and the builder, Mr. A. Fairhead, of Enfield. Total cost is estimated at 1,080*l.*

SERIOUS FIRES.

Fire among Workshops.—On Tuesday night, the 24th ult., a fire broke out in the midst of a number of workshops, in Newcastle, upon a piece of ground between Bath-lane and Westgate-road, belonging to Messrs. Herdman & France, joiners and builders; and, besides occupying workshops upon the site, they have also workshops let off to Mr. Cockburn, implement manufacturer; Mr. Angus, coach-builder; Mr. Henderson, painter; Mr. Craig, painter; Mr. Bell, cooper; Mr. Carrick, painter; Mr. Guthrie, furniture dealer; Mr. Mason, picture-frame maker; and Messrs. Glen & Liddell, coopers. A great amount of damage was done. Some men had been working late in one of the workshops, and it is supposed that the fire had originated in some sparks left by them.

Fire at a Cotton-mill.—A fire broke out in Constantine's Mill, Droylsden, near Manchester, on the 26th ult. The mill is a large one, and contained 12,000 spindles. Alarm was at once given, but before the arrival of the fire-brigade the roof fell in, and the building was totally destroyed, except the ground-floor, which is fire-proof. The damage is estimated at over 13,000*l.* The origin of the fire is unknown.

Fire at a Timber Merchant's.—About midnight on Thursday, the 26th ult., a destructive fire was discovered in the extensive works of Mr. Newsum, timber merchant, of Lincoln. The fire is supposed to have originated in the engine-room, and being favoured with a breeze, speedily extended to the yard and outbuildings, which were stored with a great amount of timber. It was discovered by the foreman, who resides on the premises, and who at once raised an alarm. In a short time the whole mass of timber and outbuildings were in a blaze, and it was not until the arrival of a steam fire-engine from Wellingore (the property of Mr. Revill), that any stoppage could be put to the flames. This engine, fed from the Witham, poured torrents of water on the burning mass, and eventually the flames were got under. The premises are situated in a thickly-populated part of the city, and fears were entertained for the safety of the adjoining property. The damage is estimated at about 10,000*l.*, and Mr. Newsum is not insured, the Insurance Companies refusing the risk until the erection of certain walls which were near completion.

Large Fire at a College.—A great fire broke out in Blackrock, in the suburbs of Dublin, early on Saturday morning, at the French College. At the time of the fire there were 264 students in bed, but no lives were lost. The fire originated in the linen-room, and spread with great rapidity to the library, bandroom, and dormitories, comprising the west wing of the college, which was completely destroyed. Many valuable musical instruments, as well as the contents of the fine library, were burned. The loss is estimated at between 5,000*l.* and 10,000*l.* The clothes and furniture of 270 students were also consumed.

Destruction of 100 Fathoms of Firewood.—On Saturday morning last, the Metropolitan Brigade were called to a fire at the timber yard of Mr. George Martin, Cranbrook-street, Old Ford. An immense stack of about 100 fathoms of firewood, occupying a plot of ground nearly 1,000 feet square, was destroyed, and two horses were burnt to death. The origin is unknown. The loss will mainly fall upon the Union office.

Fire at a Packing-case Maker's.—On Saturday morning last, a fire happened at 28, Wellclose-square, in the occupation of Messrs. H. Smith & Co., packing-case makers, and resulted in the entire destruction of a building of four floors. The Guardian office bears the insurance.

EXPLOSIONS.

Greenwich.—On the 27th November an explosion occurred in the sewer at the junction of Clarence-street and King-street, Greenwich, to the no small alarm of the neighbouring residents. The sewer, it appears, has been undergoing some repairs, and the workmen had left for breakfast only a few minutes before the explosion took place. The iron covering of the man-hole at the corner of the street, and the ventilator a few yards off, were blown up, and the former was projected by force of the explosion to the other side of the street. Several paving-stones and a quantity of earth were also dislodged, and the windows of three or four houses on each side of the street were more or less wrecked.

Wakefield.—An explosion of gas occurred on Tuesday, the 24th ult., in an office attached to Messrs. Martin & Guest's timber yard, the gas it is supposed, having accumulated in the building owing to the laying of some mains in an adjoining street. The office boy was found to be insensible, and the office nearly destroyed.

Bournemouth.—A serious explosion of gas took place at the residence of Miss Orred, on Wednesday, the 25th ult. The butler took a lighted candle to ascertain the source of an escape, and the usual result followed. Much damage was done to furniture, windows, &c., and the butler, as the penalty of his folly, had his face badly burnt and his whiskers singed. It seems necessary to be ever repeating the advice to open windows and doors before attempting to discover the escape of gas with a light.

CO-OPERATIVE EMIGRATION.

SIR,—I think some such system as that proposed by "Lover of Progress" in your pages is practicable, and, for one, should be disposed to join a company of the kind going out to Canada rather than Australia, the latter being too far from the old country. I know something of "shanty life" and "roughing it" in the backwoods, having spent nearly two years in different parts of the States.

A capital of 100*l.* per man, I think, would be quite low enough, as the minimum; it would ensure the colonists being a more provident and superior class, not so likely to run away from any difficulty that might turn up. It would be also advisable, in my opinion, to secure a larger quantity of land than your correspondent speaks of, in the value of which a rapid rise would take place as population and immigration flowed into our model colony. The best plan would, I judge, be the Wakefield system. One great, I think the greatest, evil in emigration by your correspondent's plan would be removed, namely, that of being put down in the midst of a lot of hungry land-agents, knowing no one, feeling a little disappointed in the country, as most do on arriving, very lonely, and, unless possessing a stout heart, beginning to be despondent, especially when one has left many friends and pleasant associations at home. "Lover of Progress" does not say anything about the fair sex. I really think they would be necessary to the well-being of the young colony; in fact, having spent some months in a mining district of the States without having spoken to a woman, and hardly seen one, though there were 200 or 300 men, that cannot say much for a plan of that kind; the proper system would be, I think, to transplant a village as well as possible from the old over-populated country to the new, putting it down by some railroad or river. Some few would have to go out first to make necessary arrangements, putting up a few shanties, &c.

I would have every one undergo an examination as to his character and ability for work, to prevent disappointment when there. The great majority would necessarily be farmers, but a few of all kinds of artizans necessary to the well-being of the colony would be taken.

A great saving would be effected by co-operation, especially in distribution, and no one being idle, capital would rapidly accumulate. Every one knows that in any civilised community, were all to work two or three hours per day, it would be quite enough to supply them with necessaries, and many luxuries; but, as our colony would not be content with working in that way, we should add to our capital rapidly; also, by reducing the middle-men,—men employed for protection, such as policemen, who here have to be supported from the hard-worked brain and muscle of the working man,—a wonderful economy would be effected.

I hope many will take up the idea commenced by "Lover of Progress," and soon the preliminary steps will be taken by the way of offices, and so on.

YANK.

STRIKING DIFFERENCES.

A WESLEYAN chapel is about to be built at Hastings, Mr. W. Pocock, architect; and fifteen builders, after duly pricing out all the items, thus state, we are told, the sum which each thinks he ought to have for executing it:—

Boshall	£7,430	0	0
C. & H. Burchell'	5,550	0	0
Perigoe	5,532	0	0
Parks	5,425	0	0
Stentiford	5,287	10	6
Niblett & Son	4,848	0	0
Potter	4,559	0	0
Wood	4,483	0	0
Avard	4,374	0	0
Vidler	4,294	0	0
Winter	4,276	0	0
Womersley	4,260	0	0
Pattender	4,229	14	0
Wilson	4,200	0	0
H. & C. Hughes	3,945	0	0

THE BOOK OF KELLS.

AN explanation was given some time ago in the Dublin correspondence of the *Times* of the erroneous statement respecting the disappearance of the Book of Kells, as mentioned in the *Builder*, p. 957, *ante*.

What happened, it seems, was this. The book was brought over by the librarian of Trinity College, Dublin, under the impression that it ought to be rebound, and that so important a work should be done by the workmen employed in the British Museum. He brought it to Mr. Bond, keeper of MSS., British Museum, and took his receipt for it. Mr. Bond dissuaded him from meddling with the present binding, which, though mean and common for so precious a volume, was still in a strong condition.

He, however, requested Mr. Bond to keep it for a time, to give opportunity to scholars to inspect it. On his return to Dublin the Provost and Fellows learnt, for the first time, what had been done without their knowledge and authority,—and they sent a messenger to Mr. Bond, by whom the MS. was returned to them accordingly.

Mr. Bond enlightened the College authorities as to the condition of the MS., which was suffering much deterioration, and they thanked him for his suggestion for its future preservation, which they thought highly important.

It was the error of bringing the MS. over to England without the knowledge and sanction of the College authorities, which occasioned alarm, and gave rise to rumours.

London School Board Expenses.—Speaking at a meeting at Westminster on Friday night, Mr. George Potter, one of the members of the London School Board, gave an account of the proceedings of that body, and said the sum it will have expended on education up to March next would amount to 1,032,000*l.*

LIABILITY OF BUILDERS, COMPANIES, AND OTHERS TO RECOUP RATES LOST THROUGH DEMOLITION OF RATEABLE PROPERTY.

The Court of Common Pleas have just decided a point of law of some importance to parties rebuilding, making new streets, railways, and public improvements. Some years ago, the same law point was settled by the Metropolitan Railway Company recouping the parish of Chelsea about 10,000*l.* for the loss of rates. In that case, however, the loss was permanent. In the present instance, the loss of rates is likely to be restored by new buildings.

The parish officers of St. Mary, Lambeth, claimed upwards of 6,000*l.* from the Metropolitan Board of Works, for rates which the parish had been deficient, during the construction of the Albert Embankment.

The arguments of counsel, for and against, would fill a number of the *Builder!* but Mr. Justice Denman, who delivered the judgment of the Court, laid all the chief points bare. He observed that the questions submitted to the Court were, whether the Metropolitan Board of Works were liable to pay the deficiency, or any part thereof, in the poor-rate and land-tax, under the Thames Embankment Acts; and if so, whether the plaintiff could legally enforce the arrears from 1865 to 1870 in a lump sum. One of the Acts recited that the Board of Works should be liable to pay the deficiency of rating upon property taken by them until the completion of the works. There had been a variety of argument as to the meaning of this section, but the Court were of opinion that the meaning was that the Board should stand in the position of the occupiers of the demolished houses, and pay what those persons would have paid if the Board had not taken the houses, and the amount payable by the Board was what the parish had lost upon these assessments down to the time when the works were completed. It had been argued that the Board was discharged from liability, as the deficiency was not demanded from them from time to time when the rates were made, because the ratepayers were a shifting body, and could not now be indemnified; but the Court were of opinion that the liability was not extinguished by delay, and that the demand down to May, 1870, could legally be made a lump sum. The Court also thought that the overseers of 1871-72 were entitled to enforce the payment. The amount payable by the Board would be the aggregate of the rates that would have been payable by the owners or occupiers if the property had not been taken; but they would be credited with the amount of rating upon new buildings erected upon the new sites. The question of costs to be reserved. Judgment for the parish of Lambeth.

In connexion with this decision there is a probability of more than one contemplated street improvement brought forward by speculative building companies being reconsidered.

MONUMENTAL.

Monument to the Duke of Kent.—Her Majesty's memorial altar-tomb of his late Royal Highness the Duke of Kent has just been finished, and placed in St. George's Chapel, Windsor Castle, upon a site at the west end of the south aisle of the nave close to Beaufort Chapel. The tomb has been erected upon a broad platform of darkly-coloured marble, forming a rich and handsome pavement. The alabaster sarcophagus, ornamented with quatrefoil panels, is surmounted by a white marble effigy of the Duke in a recumbent position, clothed in his robes. The head rests upon a tasselled cushion, the left hand lies upon the breast, and in the right hand is a sword. The feet of the statue are towards the east, and beneath, upon a sunken tablet, is a dedicatory inscription in Latin. Mr. J. E. Boehm has executed the figure of the Duke of Kent. The tomb was designed by Sir G. G. Scott.

Foley's Statue of General Stonewall Jackson, for Charleston.—This statue is nearly completed at the Manor Foundry, Chelsea. It is of heroic dimensions; a single figure, standing, with a drawn broadsword in the right hand; this hand grasps, while it rests on, the hilt of the weapon: the point of the sword is placed on a piece of rock at the side of the figure, which is thus sustained, and in leaning on it sways slightly towards its support. The costume is modern,—a horseman's short tunic, girt by a broad belt, and buttoned close on the chest, with a military collar. Strong riding-boots, reaching above the knees, and rather loose trousers, complete the dress; the head is bare.

The late Mr. Black.—The citizens of Edinburgh, without regard for sect or party, have resolved to erect a monument in memory of the late Mr. Adam Black, who twice filled the office of lord provost, for nine years represented the city in Parliament, and for the long period of sixty years discharged important public duties.

Monument to Jeremiah Horrocks.—It is proposed to do honour to Jeremiah Horrocks by erecting a tablet to his memory in our National Mausoleum at Westminster. The Dean and Chapter of Westminster having given permission for the erection of the tablet in the Abbey, subscriptions are being collected to defray the expenses. The Rev. R. Brickel, rector of Hoole, who occupies "the same old pulpit from which the Lancashire curate spake of his higher duties," will receive subscriptions.

SANITARY MATTERS.

Birmingham.—The mayor (Mr. J. Chamberlain) has intimated his intention to carry out, during his year of office, a comprehensive scheme of sanitary reform for the borough.——It is intended to invite the attendance of sanitary committees of corporations, medical officers, and others especially interested, from Manchester, Liverpool, Leeds, Sheffield, Bristol, and other towns, to a conference on sanitary questions, to be held in Birmingham in January.——A private meeting of gentlemen interested in sanitary matters has been held in the Town-hall Committee-room, for the purpose of offering suggestions respecting the forthcoming Sanitary Conference in Birmingham. The Mayor presided, and explained that the questions upon which papers would be read and discussion invited, would probably be the Sanitary Condition of large Towns and the Dwellings of the Working Classes; and that invitations had been sent to a number of gentlemen in various parts of the country who would be likely to assist in the deliberations of the conference. Suggestions were invited, and a number of hints were thrown out.

Exeter.—The question of providing a comprehensive sanitary scheme for Exeter, and one which, by dealing with the whole matter of the disposal of the city sewage, will include, by necessary implication, the subsidiary question of freeing the river from its present impurities, is once more about to come before the town council in a practical form. The city surveyor has already formulated a scheme for the purpose, the execution of which, it is estimated, would cost something like 30,000*l.*, and this plan will shortly be submitted to the town council by the committee to which the whole question was referred.

CHURCH-BUILDING NEWS.

Kingston-uxta-Lewes.—The reopening of the church in this parish has taken place. The church, which consists of chancel, nave, tower, and porch, and is of very early date, has undergone a thorough restoration. The old square pews, gallery, pulpit, and desk, have been removed and given place to open benches of English oak in the nave, and seats of wainscot in the chancel, which is seated stall-wise. There is ample space in the sanctuary, and the whole floor is laid with encaustic tiles, from the works of Mr. R. Minton Taylor, Stoke-upon-Trent. The communion-table and rails are of solid oak. The pulpit, which has a stone base and oak top, occupies the north-east angle of the nave, and a lectern stands on the opposite side. The stone work generally has been restored. The tower is divided from the nave by an oak screen, and is intended to be used as a vestry. All the windows, doorways, copings, &c., have been restored or renewed, in accordance with the original designs, and the stone walls pointed. The roofs are boarded under the old rafters, and formed into panels by moulded ribs, the nave ceiling taking the shape of the rafters, the chancel being wagon-headed, with moulded ribs. A new feature in the church is a porch designed by the architect, Mr. Robert Wheeler, of Tunbridge Wells, under whose superintendence the restoration has been carried out by Mr. C. J. Berry, of Lewes, builder. A church of St. Pancras, Kingston, was originally erected in the eleventh century by William de Warrenne and Isabella, his countess. The present structure was built in the fourteenth century, in the Second Pointed style, and, after a lapse of 500 years, it has fallen to the lot of the Rev. John Goring, of Wiston Park, to restore the edifice (at whose sole expense, nearly 2,000*l.*, the work has been done).

Wall (Lichfield).—The church of St. John, Wall, near Lichfield, has been re-opened after having undergone renovation, involving the decoration of the chancel and the re-arrangement of the seats for the choir, which have been placed stallwise at the east end of the nave, and open benches have been substituted for pews through the church. A painted window, by Ward & Hughes, representing in the centre the "Good Shepherd," and on each side the "Blessed Virgin and St. John," has been inserted in the chancel, and underneath it are fixed tiles, which form a reredos.

Little Aston.—On Thursday, the 19th ult., the newly-built village church, dedicated to St. Peter, at Little Aston, in the diocese of Lichfield, was consecrated by the Bishop of Lichfield. The church has been erected from designs by Mr. G. E. Street, R.A., at the cost of the Hon. S. Parker-Jervis, of Little Aston Hall. The architecture of the edifice is Early English Gothic, with lancet-headed two-light windows, deeply recessed inside with splayed jambs; the east and west windows are a three-light and five-light respectively. The church comprises nave, chancel, north aisle, and vestry; internal dimensions being from east to west 72 ft., and width from north to south 32 ft. 6 in. The baptistery at the south-west angle of the nave is semi-circular, and projecting from the main line of building externally. The vestry, in which is placed the organ, is on the north side of the chancel. At the west end of the north aisle is the tower, and the communication to the ringing-floor is by a York stone spiral staircase. In the belfry, which is only 9 ft. square, is placed a peal of five bells (the tenor weighing 9½ cwt.), erected by Messrs. Taylor, of Loughborough. The height of the tower and spire is 95 ft. The broaches of the spire are surmounted by sunk panelled pinnacles, with foliated finials. The church is built of a light red sandstone. The faces of the walls are of wrought stone; the general walls are finished with a boasted face, and the dressings are rubbed. The north aisle is separated from the nave by arcading of three arches, the columns of which are circular on plan, with moulded caps and bases. The lead glazing is with cathedral rough plate, with a border of white glass. The organ was built by Messrs. Halmshaw, Birmingham, Mr. Street supplying the design for the oak case. The font consists of a Caen stone moulded base, surmounted by marble and alabaster shafts, supporting an octagonal bowl, the panels of which are inlaid with polished Italian marbles of various colours; the panels of the pulpit are similarly treated. The chancel steps and pavement are of marble. The pulpit, font, and chancel pavement were executed by Mr. James Forsyth, London. The reredos, executed by Mr. Thomas Earp, London, consists of a Purbeck marble moulded plinth. The centre portion, over a super-altar of Devonshire marble, consists of five compartments or panels, the framework of which is in alabaster, carved. The altar, which is raised five steps above the nave floor-line, is of oak, as is also the altar-rail, with brass standards. The church is heated with hot air, the apparatus for which was supplied and erected by Messrs. Haden, of Trowbridge, and is built to accommodate 153, including children. The works have been carried out by the builder, Mr. R. Yates, of Shifnal, under the supervision of the architect's clerk of the works, Mr. J. W. Randle. The cost of the whole work, exclusive of the value of ground, is about 5,500*l.*

East Hardwick.—On Wednesday, the 25th ult., the Archbishop of York consecrated the new church at East Hardwick, near Pontefract. The foundation-stone was laid in October, 1872, by the Marquis of Ripon. The total cost has been about 2,500*l.* At the close of the Archbishop's sermon a collection in aid of the building fund was made, which amounted to 53*l.* 13*s.*

Strabane.—The Duchess of Abercorn has laid the foundation-stone of a new church at Strabane. The old church was founded there by the Duke's ancestors, 260 years ago.

Wymington.—This is a small but interesting village, some five miles from Wellingborough. Its parish church possesses several features of interest, and forms one of the noteworthy churches in the county of Beds. It occupies the site of an older church. The present building stands as a monument to the piety of John Curteys, a lord of the manor of "Wymynton," and Albreda, his wife—a "Seynt John" being a member of the St. Johns of Bletsoe Castle—the record on their tomb still existing in a good state of preservation in the church, setting forth that the church had been built anew (*de novo*) by them. The date of the structure, as nearly as may be fixed, was 1377—the last year of the reign of Edward III. It is considered one of the best specimens in the county of the late Decorated style. As it was built five hundred years ago so it remains now in its main features. The windows are of a pronounced character, the tracery assuming graceful forms, and inclining to the Flamboyant. The east window, of five lights, is a fine specimen of the period. The architectural ornamentation of the church includes trefoils, quatrefoils, and crockets. The church consists of nave, north and south aisles, south porch, chancel, lady chapel, and chapel dedicated to St. John the Evangelist, and vestry,

which, with the exception of the vestry, are all under one roof, which is still covered with the ancient lead. There are also a tower and spire, both of which are ornate. In the south wall of the chancel, within the communion rails, are two sedilia and a canopied piscina, all examples of the Decorated period. There are several interesting brasses in the church. Just below the window of the Lady chapel are the remains of an altar to the Virgin, of the Perpendicular style of architecture. On the left is a piscina, and in the right jamb of the window a Perpendicular niche has been inserted, in which in all probability, an image of the Virgin was placed. The edifice is now in all the glory of whitewash; the seating is capable of great improvement; the tower arch is built up and plastered; and in other respects the desirability of restoration is manifested.

Houghton.—The parish church of Little Houghton has recently undergone extensive alteration. The old edifice had fallen into a dilapidated condition, and its restoration and enlargement have now attained completion. Formerly the church consisted of the nave, south aisle, and chancel, and the present old embattled tower. A north aisle and an organ-chamber have been added, while the old part of the edifice, with the exception of the tower, has been substantially rebuilt in the Decorated style. The tower arch has also been displayed by the removal of an ugly west-end gallery; the tower chamber being thus thrown open to the nave and lighted by two single-light stained-glass windows. An oak screen, surmounted by a cross, separates the nave from the chancel. The pulpit is a low, carved oak structure on a stone base, and approached by stone steps. The tops of the choir-stalls are also of carved oak. The church has been entirely re-seated with comfortable open seats of stained deal. The restoration, which cost altogether about 3,000*l.*, was carried out from the designs of the late Mr. Buckeridge, by Mr. Gee, of Daventry. Besides the above alterations and restorations several new features have been added to the chancel. A new east window has been erected, and a new reredos constructed as a memorial of the late William Smyth, esq. The east window, which is by Messrs. Hughes & Ward, represents Christ's appearing in the midst of his disciples after the Resurrection, and bears the inscription, "Peace be unto you." The reredos, a piece of carved stonework, consists of three panels: the left-hand compartment representing the Annunciation, that on the right hand, the Adoration of the Magi; and the central compartment, Our Saviour in His glory, bearing the symbols of His divine sovereignty, and surrounded by angels. The figures are carved in alto-relievo. Two memorial stained-glass windows have also been erected on the south side of the chancel.

Walsall.—On Wednesday evening, the 18th ult., St. Paul's Church was re-opened by the Rev. G. W. Woodhouse, M.A., vicar of Albrighton. The old-fashioned pews in the body have been removed and replaced by open seats of pine, stained and varnished, the doors having also been taken away from the seats in the galleries. The chancel has been remodelled and re-arranged, the floor having been raised about 9 in. and laid with encaustic tiles; the organ brought down from the loft and placed on the north side; seats provided for thirty-two choristers; and the old pulpit, which stood on the north side, dispensed with, and a new one of oak of elegant design placed on the south side with an entrance from the vestry. A new heating apparatus has been put in by Mr. Haden, of Stourbridge. The whole of the interior has been repainted with colours of sober tint, relieved by stencillings. The cost of the alterations will be about 600*l.*, towards which about 450*l.* had been promised prior to the opening service. The work has been carried out by Messrs. Rowley & Lynex, builders, under the direction of Mr. Chamberlain, architect.

Willesborough.—The new Free Church (Christ Church), Willesborough, which owes its erection to the munificence of Mr. Joseph Foster, of Sprotlands, was dedicated to the worship of God on the 25th ult. The site of the church is on the high road to Hythe, and about half a mile from Ashford. The material employed is chiefly Kentish rag, with Bath stone dressings. The apex of the roof is 48 ft. from the floor, and it springs at a sharp angle from the side walls, which are 60 ft. in length. The width is 36 ft. On the east side are four lancet windows, and there are corresponding windows on the west side. There is an entrance-porch facing the Hythe road, over which is a window of three lights, and on each side a circular light. At the opposite end of the church is a larger three-light window. The glazing is of the greenish-tinted cathedral glass now so much in vogue, with light orange-coloured margins. There are three rows of sittings, constructed of pitch pine, stained and varnished.

DISSENTING CHURCH-BUILDING NEWS.

Silverdale.—The foundation-stone of a new Congregational chapel was laid at Silverdale on Monday, 16th inst. For some time past service has been held in the Temperance Hall, but more suitable accommodation having become indispensable, a public subscription was set on foot, and many donations were made by the Congregationalists of North Staffordshire. The site of the new chapel is about the centre of Victoria-street. The building will be a plain Gothic structure, having a porch and tower. There will be a small gallery at one end. Land has been secured for a school at the rear of the chapel, but the building of a school will remain as a work for the future; so, for a time, the edifice will serve both for chapel and school. The place is to seat about 400 people, and the cost is estimated at 1,500*l.*, including land and all other charges. The architect is Mr. W. P. Sugden, of Leek; and the builder, Mr. Bennett, of Burslem. The foundation-stone was laid by Mr. Arthur Nicholson, of Leek, in the unavoidable absence of his father, Mr. Joshua Nicholson, through indisposition.

Deepfields.—A new Unitarian Chapel, superseding one built in 1717, has been opened at this place.

Cambridge.—After being in the hands of the contractor, Mr. F. Thoday, for about seven months, the new Baptist Chapel in Fitzroy-street (Eden Chapel) has been opened for divine worship. The building, the plans for which were drawn out by Mr. H. S. Thoday, is brick-built, and will cost about 2,000*l.* It is approached from Fitzroy-street by a flight of stone steps, at the top of which, in a vestibule, a pair of doors to the right and left open into the chapel. It is said that the building will afford accommodation for about 730 people. The plain open benches with inclined (red-deal) backs are of pitch pine, the floor declining about 1 ft. from the entrance to the pulpit. The pulpit and rails are also of pitch-pine, the gallery-front being made of red deal, with perforations. There is a baptistery between the pulpit and the communion-rail, which is kept covered except for special occasions. The building has a queen-post roof, with small cast-iron ventilators. The gallery is supported on cast-iron columns. The windows are filled with rough-plate glass. There is a school-room beneath the chapel, besides vestries and other accommodation. The building is warmed by Hayden & Son's hot-air apparatus, and is lighted with gas, the fittings for which were erected by Mr. W. Audley.

Books Received.

Practical Hints on the Erection of Places of Public Worship, compiled for the Congregational Chapel Building Society. By the Rev. J. C. GALLAWAY. Third edition. London: Snow & Co.

THE Congregational Chapel Building Society's main object and reason of existence is to promote improved and satisfactory church building, and the little manual of which, after nineteen years, a third edition is now published, has doubtless materially helped towards the end in view. It is written in a good spirit, and contains much information likely to be useful to bodies desirous of erecting chapels. It very properly urges the appointment of a competent architect as of the first necessity, and the information it affords is to enable committees and others concerned to make up their minds as to what they want, and to give proper instructions to their architect.

VARIORUM.

MESSRS. MARCUS WARD & Co. (Chandos-street), evidently exercise care in the selection of the stories they publish, and the artists they employ to illustrate them. We have now before us a pile of their new story-books for old and young readers; for example,—"Country Maidens," by M. Bramston; "Christmas at Annesley, or, How the Grahams spent their Holidays," by Mary E. Shipley; "A Very Young Couple," by the author of Mrs. Jerningham's Journal; "Our Games," a Story for Children, by Mary Hamilton; and "The Twin Brothers of Elfvedale: a Story of Norwegian Peasant Life Fifty Years ago," by Charles H. Eden; and we can recommend them all as very interesting and fitting. The coloured illustrations in "The Twin Brothers" are particularly good of their kind.——As to the *Latch*, we get the following from the *Bible Educator* for December:—"Latchet (*subst.*). Synonymous with the modern *lace* (cf. 'boot-lace,' 'staylace'), of which it is diminutive, used only in the A. V. as a 'fastening of a sandal,' 'a shoe-string.' Gen. xiv. 23, 'I will not take from a thread even to a *shoe-latchet*,' where Wiclif's version has 'the thong,' or 'the lace of his schoon.' Isa. v. 27, 'Neither shall the girdle of their loins be loosed, nor the *latchet* of their shoes be broken.' Mark i. 7; Luke iii. 16, 'The *latchet* of whose shoes I am not worthy to unloose.' *Latchet* is a derivative from the Latin *laqueus*, 'a snare,' through the Italian *laccio*, 'a thong,' 'a string,' and its diminutive *laccietto*, and the French *lacet*—all related to the A.-S. *laeccan*, 'to lay hold of,' 'to catch.' The word latch, both in the substantive and verb form, is now restricted to the fastening of a door, but was formerly used in a much wider signification,—*e.g.*, by Chaucer, for a 'snare,'—

> 'Love will none other birde catch,
> Though he set either nette or *latch*.'
> (*Rom. of Rose*, 1634.)

And by Shakspeare,—

> 'I have words
> That would be howled out in the desert air,
> Where hearing would not *latch* them' [lay hold of them].
> (*Macbeth*, iv. 3)."

——The first part of *Cassell's Family Magazine* (in its new form) contains as a frontispiece a charming engraving by Mr. C. Jeens, from a drawing by Mr. Millais, called "A Reverie,"—which, however, we have somewhere seen before. The number itself is an excellent one.——With the first part of Cassell's "Illustrated History of the United States," just now published, is presented an engraving of "The Landing of the Pilgrim Fathers," from the original painting by Charles Lucey. It is of large size, and altogether a remarkable woodcut.——The new number of the *Leisure Hour* describes Houses in New Guinea:—"Each dwelling here, as at Katau, is of great length, built on lofty piles, and provided at each gable-end with a wide verandah and a ladder. The interior of this spacious edifice is dark and gloomy, the thatch covered with soot. They build on piles for security against alligators and serpents, and to escape the annual inundations. The flooring is of cabbage-palm. On both sides of the interior are slight partitions of bamboo, large enough to admit a man and his wife, who sleep on the bare boards. No door or screen exists. Between every couple of sleeping-cribs is a circular mass of moist clay, where at sun-down fire is lighted. Close to each berth is a shelf for tinder (bark of the *Melaleuca*) and firewood. On this soft bark infants sleep. In one large house at Torotoram there was accommodation for from sixty to eighty couples. The chiefs have houses of their own. In each village there are two large houses, one for boys, the other for girls. Elderly custodians, armed with long sticks, are expected to keep the young people in order. This custom obtains on Saibai and Bampton Island, proving those islanders to be colonists from the mainland. Their houses are thatched with the leaves of the sago-palm, which grows freely in all parts of western New Guinea."

Miscellanea.

The Preservation of Clapham-common. The Metropolitan Board of works, who are now the conservators of Clapham-common, in compliance with the wishes of the residents of Clapham, determined to permit the Common to remain intact and as an open space free to the public. No turf, mould, gravel, &c., will be allowed to be dug or taken off the common, but the privilege of ratepayers having rights to pasturage will not be interfered with. Some young trees have recently been planted by the roadside, and the common, already studded with forest trees, will present a park-like appearance. The ponds of stagnant water are to be purified and the common drained, but the intention of converting it into a pleasure and recreation ground is entirely abandoned.

Geology of Gloucester.—The construction of the Sharpness Docks has not been without special interest to the geologist. A submerged forest converted into peat was found in the excavations lying towards the river bank. Mr. W. C. Lucy made an examination of the "diggings" as they proceeded, and read a description of the forest to the Cotteswold Club last year. From this we learn that the peat bed into which the forest has been transformed lies in a hollow. Its maximum thickness was 14 ft. The trees were chiefly oak, alder, beech, and hazel. Hazel nuts were found quite perfect. The wood forming the peat of the underlying portion was much decomposed, with some fine sand in it. Some of the oaks were of considerable size, one measuring as it lay 80 ft., and 2 ft. 9 in. in diameter at the top, and more than 5 ft. at the bottom. About 2 ft. from the bottom, were found a fine head of Cervus elaphus, with the antlers apparently cut off by some rude implement, the antlers and jaw of a small deer, the head of a horse and Bos longifrons, the skull of a dog, and the tusk of a boar. About sixteen years ago the head with horns attached of a very fine Bos primigenius was found. In all probability, the land in this part of the Severn Valley, and the lias beds at Gloucester and beyond Tewkesbury, were eroded, after which a vast forest growth must have gone on for ages.

Law of Principal and Agent.—The question determined in the case of Hamer *v.* Sharp, was one with reference to the binding effect of an authority given by a vendor of real estate to an agent for the sale of it. The plaintiff was the purchaser, and the defendant the vendor of the property in dispute. Prior to October, 1872, the defendant was the owner in fee of some freehold premises in Bradford, and he gave Mr. Longbottom, estate agent, Bradford, this memorandum of instruction:—"I request you to procure a purchaser for the following freehold property, and to insert particulars of the same in your monthly estate circular till further notice." Mr. Longbottom advertised the premises for sale (with, as the plaintiff insisted, the defendant's knowledge) till January, 1874. The plaintiff then contracted with Mr. Longbottom for the purchase of the premises for 2,800*l.*, and paid him a deposit of 280*l.* in respect of the contract. The plaintiff insisted that Mr. Longbottom had full authority, as agent of the defendant, to enter into the contract. Vice-Chancellor Hall said he should hold that when an authority was given to an agent, having regard to the fact that it related to landed property, the agent should, as a matter of course, state something with reference to the limitation of the title. Consequently, it must be considered that such a document as the one now in dispute did not authorise the agent to sign a concluded contract on behalf of the vendor.

The Sheffield Society of Artists.—A meeting of artists was held last week, at the King's Head Hotel, to receive the report of a committee appointed at a former meeting to take steps to form an Art Society in Sheffield. Mr. William Pool was voted to the chair, and the rules suggested by the committee were then discussed and, with slight alterations, passed. The following gentlemen were elected members of the society, viz.:—Messrs. James Baldock, H. F. Crighton, William Ellis, T. B. Hardy, J. H. Hawksworth, Robert Hudson, jun., William H. Pigott, James Poole, William Poole, Richard Smith, Theophilus Smith, Read Turner, and Arthur Wilson. Mr. Richard Smith was elected president, Mr. H. F. Crighton, vice-president. Messrs. Smith, Crighton, Pigott, Hawksworth, and Turner were elected a committee; and Mr. C. Swindell, treasurer and hon. secretary. The Society thus formed has long been needed in Sheffield, not only to bring artists together in friendly emulation, but to assist the public in discriminating between good and inferior art. The temporary office is at 61, Fargate.

Peal of Bells for St. Paul's Church, Chippenham.—At the time of the erection of this church, accommodation was provided in the belfry for a peal of eight bells, but up to the present time it contains only three. During the last few weeks steps have been taken to provide for the other five bells, and an appeal for subscriptions for the purpose has been liberally responded to. About 200*l.* have been subscribed, and Mr. Poynder has consented to provide and fix at his own expense, the tenor bell, at a cost of about 130*l.* The cost of the five bells will be about 360*l.*, and the order has been given to Messrs. Myers, of London, to complete the peal, which will be executed by Easter next.

Sanitary Prosecution. — At the Aston Police Court on Friday, 27th of November, Mr. Henry Bird, commercial traveller, Erdington, was summoned for "that he did unlawfully and knowingly let a certain house, at Erdington, in which a certain person had previously been suffering from small-pox, without having the said house properly disinfected, contrary to the form of the statute." He was further summoned for unlawfully and knowingly selling, or causing to be sold from the said house a carpet and other articles, without having them disinfected. Mr. Bedford said the evidence for the defence told in his favour. It appeared that precautions had been taken by the defendant, but at the same time he had committed an offence against the Act of Parliament. The house should not have been let in the way it was, therefore they would fine him in the mitigated penalty of 4*l.*, the second case being withdrawn. The question of costs was then considered, and on the defendant agreeing to pay 5*l.* towards the costs, the fine was reduced to 40*s.*

Precaution against High Tides.—At the usual weekly meeting of the Metropolitan Board of Works on the 27th of November, the Works Committee of the Board submitted that it was desirable the Board should obtain from Parliament powers to require the vestries, district boards, and owners of property abutting on the Thames, within the metropolitan area, to make proper walls and defences for the protection of their parishes and districts from floods. Mr. Richardson, deputy-chairman of the committee, said that as the water, besides injuring property in the vicinity of the floodings, went down the sewers, and had to be pumped up again at the several stations, thereby occasioning great expense to the ratepayers, the improvement was very desirable. A resolution in accordance with the suggestion of the committee was adopted.

Cabmen's Rest in Glasgow.—By the kindness of Mrs. John Burns, of Castle-Wemyss, the cabmen of Glasgow have been provided with what must be to them a most valuable gift,—a house of shelter while they are waiting at the cabstand. The "Rest" has been placed in proximity to the George-street stand. It is 14 ft. in length, 7 ft. in breadth, and 13 ft. in height, while it is constructed for the most part of glass,—a range of windows, two of which are movable, running right round within 4 ft. or 5 ft. of the ground. The "Rest" has been strongly constructed by Messrs. M'Intyre & Jack, Glasgow. It is likely that, should this experiment be successful, such houses will be erected at the greater number of the stands throughout the city.

Meeting of Carpenters and Joiners.—On Monday last, a special meeting of the carpenters in Leicester was held at Mr. Fox's, the Fish and Quart, Church-gate, at which the following resolutions were unanimously adopted: — 1. That employers be solicited for an advance in wages of 9d. per hour from the 1st of June, 1875. 2. That the overtime clause be altered, viz., time and a quarter from six till eight p.m.; that from eight p.m. to five a.m. time and a half. 3. That six a.m. shall be the uniform hour for commencing work in shops, and that in all unprotected buildings men shall commence work at seven a.m. and leave at five p.m., six weeks before and six weeks after Christmas, and to receive ½d. per hour extra to men working in shops.

Medical Officer of Health and Analyst for St. James's, Westminster.—The Sanitary Committee have reported on the appointments of medical officer of health and analyst, recommending that the union of the two offices be confirmed; that the duties to be performed, in addition to those prescribed by the several Acts of Parliament relating to the appointments be similar to such as were performed by Dr. Lankester; that the annual salary be 200*l.*, viz., 150*l.* as medical officer of health, and 50*l.* as analyst; and that an advertisement for candidates to fill the appointments be inserted in the medical papers. The report was agreed to, and advertisements ordered accordingly.

Child Murder in St. James's, Westminster.—At a recent meeting of the Vestry of St. James's, Westminster, Dr. Hardwicke, acting medical officer of health, said that the infant mortality amounted to about 50 per cent., and he did not know what the poor would do in their small rooms if all the children lived. Among illegitimate children the death-rate was often as high as 90 per cent.

The Proposed Conservatory at the St. James's Theatre.—A short time ago a proposal was made by the lessees of the St. James's Theatre, King-street, to erect a conservatory over a portion of the portico, and the permission of the Metropolitan Board of Works was sought to carry out the object. The Board referred the matter to the St. James's Vestry for their consideration, and that body have refused to sanction the undertaking, stating, in a communication to the Metropolitan Board of Works, that they consider the erection of such a structure objectionable.

The St. James's Hall Company have purchased further properties in Piccadilly, and intend erecting more extended buffets, grill-rooms, and other conveniences in connexion with the Hall and Restaurant. The frontage in Piccadilly will be about 46 ft. The altered plans are now nearly completed. The elevation in Piccadilly will be Italian Gothic mostly in red terra cotta and red Mansfield inlaid with mosaics. Contracts have been entered into with Messrs. Dawnay for the ironwork; Messrs. Gibbs for the mosaics; and Messrs. Johnson, of the Ditchling Potteries, for the terra cotta. Mr. Walter Emden is architect.

Blasting Operations, Forest of Dean.—One day last week some extraordinary blasting operations took place at Plump Hill limestone quarries, near Mitcheldean, in the presence of about 2,000 persons. In the explosion one ton of powder was employed on a shelf of rock, the shots being fired with Brain's patent battery, placed 100 yards distant from the quarries. The result was the displacement of some 8,000 tons of stone without the slightest accident.

Odcombe Church.—Literary men may like to take note that Odcombe Church, Somersetshire, where Tom Coryat hung up the shoes in which he performed his 900 miles' journey in Europe, is about to be restored and enlarged. The shoes remained in the church till 1702,—*i. e.*, ninety-six years. The outcome of the "peregrinations" of the "Odcombian leg-stretcher," as he called himself, was the famous "Crudities." Tom's father was rector of Odcombe.—*Athenæum.*

The Channel Tunnel Company have given notice of their intention to apply to Parliament, during the ensuing session, for power to take lands at the foot of the cliff in St. Margaret's Bay, about three miles from Dover, in the parish of St. Margaret-at-Cliffe, and all the beach and foreshore between Ness Point and Coney Burrow Point, for the purposes of their undertaking. Should they succeed the works will be immediately proceeded with.

Laying Off of the North Yorkshire Ironworks. — The works of the North Yorkshire Ironworks, at South Stockton-on-Tees, have been closed in consequence of the inability of the company to obtain orders at a price that will cover the cost of manufacture. These works, when in full employment, employ some 600 or 700 hands.

Rivers Pollution.—On Thursday, the 10th of December, a conference will be held at the Society of Arts to discuss "The steps to be taken to insure prompt and efficient measures for preventing the pollution of rivers." The chair will be taken at three o'clock by the Right Hon. Lyon Playfair.

Indian Iron Trade.—A wealthy firm in Calcutta, resolved to be among the first in attempting the revival of the Indian iron trade, will shortly open new works in the Beerbhoom district, near the Synthea station on the East India Railway.

The Cleveland Literary and Philosophical Society, Middlesbrough, has resolved to erect a suitable building for a library, lecture-hall, and a museum, in Corporation-road, at a cost of about 4,000*l.*

A Sewage System for Taunton. — On Tuesday, the Local Board adopted the Hillé scheme for the utilisation of sewage, which is in operation at Wimbledon, where it was inspected by two members, the medical officer, and the surveyor.

The Architectural Union Company.—The annual general meeting of this company was held at the House, in Conduit-street, on Wednesday last, when a very good dividend was declared.

Baths, Alnwick.—The Duke of Northumberland has just erected baths and washhouses at Alnwick, at a cost of nearly 10,000*l.*